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Monsieur

Je suis fort fâché pour votre maladie

27549/B

Mechanical ESSAYS

ON THE

Animal Oeconomy :

WHEREIN,

Not only the CONDUCT of
NATURE, in *Animal Secretion*, but
Sensation, and *Human Generation*, are
distinctly consider'd and anatomically
explain'd :

AS ALSO

The particular Manner of the Opera-
tion of a MEDICINE is accounted
for, and many other curious and uncom-
mon Subjects are treated of.

Necessary for all that study NATURE,
and particularly those that make Physick or
Surgery their Practice.

WITH

A CATALOGUE of the AUTHORS
consulted thro' the Whole.

By JAMES HANDLER, Surgeon.

*Nam quoniam variant animi, variamus & artes :
Mille Mali Species, Mille Salutis erunt.*

Ovid de Remed. Amoris. Lib. 2.

L O N D O N,

Printed for A. BETTESWORTH in *Pater-noster Row*, and
C. RIVINGTON in *St. Paul's Church-yard.* 1721.

Mechanical History
OF THE

WHEEL
Not only the conduct of



Nature in the human body
and the human body
the human body

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WILL
A Catalogue of the
the human body

BY JAMES WATKINS
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T O

Joshua Pembroke, Esq;

One of his MAJESTY's Justices
of the Peace for the Borough and
Liberty of *St. Albans*, in the County
of *Hertford*,

(As a SMALL Acknowledgement of a
Grateful Mind, for many Instances of
Friendship, and from a just Sense of his
Personal Merit, *Conspicuous*, both in an
Impartial Administration of Justice, and
an Untainted Loyalty to his Sovereign,
King *GEORGE*, as well as in a very
becoming Zeal for discouraging and
suppreßing of all Immorality and Pro-
faneness)

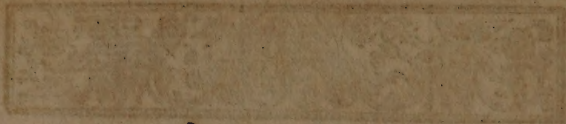
These E s s a y s are Dedicated, with very
sincere and great Respect, by

His Most Oblig'd Humble Servant,

JAMES HANDLEY.

A 2

T H E



TO

John Pembroke Esq

One of His Majesty's Justices
of the Peace for the Borough and
Liberty of St Albans, in the County
of Hertford

As a Small Acknowledgment of a
Grateful Mind, for many instances of
friendship, and from a just Sense of his
Personal Merit, I have the honor, both in an
important Administration of Justice, and
an Uninterrupted Loyalty to his Sovereign,
King GEORGE, as well as in a very
respectable Zeal for encouraging and Pro-
moting all Industry and Pro-
sperity

These Expressions are offered, with very
sincere and great Respect, by

Mr. John Pembroke Esq

JAMES HANDLEY

THE



Ralph THE *Year* 1745

PREFACE.



THE great Luminary of the World, when cloathed in dazeling Glory, sallying from his Oriental Chambers, and with radiant Beams saluting the Western Hills, making all Nature gay, and filling every Breast with glowing Joy, is not more welcome to the longing Eyes of expecting Mortals, than a kind Messenger of Health (a wise Physician) to a Man distressed with Pain or Sickness. — Pellem propelle, & quicquid est viro daturus, esset seipso, is a Proverb as old as Job's Afflictions, and has a great deal of imply'd, as well as express'd, Truth in it, altho' at first impudently utter'd by the Father of Lies in the Face of the Almighty: For a Man is not only willing to part with all he has for his Life, but for his

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Health also. For Life without Health, what is it but a living Death? And is what Nature abhors more than Death itself. Health! is the sweet Draught, in which all the Bitters of Life go down smoothly; and the Sweets are swallow'd with a greater Gust. To be then at a Certainty how to Prevent or Cure the Disease, that fills us with painful Sensations, requires our utmost Diligence and Care. But no Man can be so, that is not acquainted with the Animal OEconomy, and the Manner of the Operation of a Medicine upon the Fluids; to explicate which, is the Design of these Sheets.

And altho' I am one of the least (amongst many) that are capable of such an Undertaking; yet, as I do not hereby pretend to be wiser (only perhaps a little more laborious) than the rest of my Brethren; so, I hope, they will pardon me, if, by great Application and Care, I can inform both myself and them of somewhat we hitherto had too confus'd an Idea of: And if they will please to give themselves Leisure to read thorough, and consider every Part, before they censure any, I persuade myself that they will not think their Time ill spent, when they find it (as, I hope, they will) pleasant and entertaining, as well as profitable; altho' I know it is wholly impossible to write so as to please every Taste: And tho' I am not so vain as to think, that here is every Thing a Man ought to know, nor, indeed, every Thing that might be said

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said on the different Subjects here treated of; yet, this I know, that most of them ought to be known by every one that calls himself a Practitioner, and without which he would be far short of what he ought to know, to be a tolerable Master of his Profession.

I don't think it any Lessening either to me or the Book, (and therefore, to anticipate any malicious Reflections that Way, I frankly own) that divers Things herein contain'd, are Hints and Gleanings from other Authors; and I think every Man does the same, that writes to any good Purpose, altho' all are not so ingenuous as to own it, as I do. But, I hope I may truly say, that my Assistance does not come from the Field of the Sluggard, or Fool: Not from uncultivated Ground, or barren Soil; but mostly from Authors of very good Authority, whose Fragments lay confusedly and unintelligibly scatter'd up and down in many Volumes, without any Order (or, at least, without that which they appear in here) and not to be come at neither, without putting both Pocket and Memory upon the Tenters. And if any living Author takes it ill that I have suck'd Honey from any Flower of his, I hope I have therein done him no Injury, and have only done by him what he has done by many others much more abundantly, as I can very easily make appear.

No Man is without his Errors, and I wish I knew all mine; where the Reader thinks he finds any here, I beg him to put on Charity,

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and consider, that as I may differ from him, and yet not be in the Wrong; so I may fall in with him, and yet not be in the Right: For, as long as there are Men, they will differ in their Opinions; and so long as they differ, he must be a very wise Man indeed, that is certain all Mankind are in the Wrong but himself. But this one Thing I must desire, that as I live at a Distance from the City, and could not attend the Press, the Errata of that may not be imputed to me, which, however, I hope are not many, nor very material ones. And as some Parts of this Treatise do not so regularly follow one another, as some Criticks may expect, (and as, indeed, I could wish) I desire that Defect may be borne with also; and the rather, because it is a Miscellany, and therefore does not call for such very great Exactness: But (if that would do any Good) I could give a very substantial Reason why it could not be otherwise.

Wherein I have in some Points differ'd from many ingenious Men that have gone before me, and have turn'd out of the common Road of Reasoning, particularly as to the Modus of an human Generation; of Bleeding in the Small-pox, &c. I intreat so much Mercy of my Reader, as not to condemn me before he has heard me quite out; and then, if he cannot give into my Way of Thinking, I pray him to use me with Humanity, and he shall find, that I am not so obstinately wedded to any Notion, as not to recede from it, when I see
I am

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I am in the wrong; but then I must have Reason, and not Railing, to convince me that I am so.

In treating of the Parts design'd for (and whose proper Office is) Secretion, I have not been so very exact, as to give a particular anatomical Account of every Thing relating to the Parts I treat of; and this I do, not only because I would not swell the Book, but I thought it wide of the Design of it, to treat of any Parts, any farther than as it concern'd the Explication of what I had in present View, and to give a clear Idea of that, without troubling myself, or Reader, about any thing else; studying throughout to make the Book very pleasant as well as profitable to the Reader, much more than I have consulted the Interest or Ease of myself.

Every ingenious Man is not so happy as to have an Academical Education; but there are many however, that have Learning sufficient to qualifie themselves for some one Branch of Physick, (viz.) Surgery or Pharmacy; and such generally practising (especially in the Country) as Physicians; and too often do it by Custom and Retipe's, without rightly understanding the Reason why, and the Manner how the Medicines they administer operate upon an human Body, and so do not practise with that Art and Judgment that a Physician ought to do: Therefore, for the Use of SUCH, principally, I have taken this Task upon me; and have not given very many Formulæ, because my Business here is
not

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not so much to direct what to prescribe, as how and why, and the Reason of its Operation, and have made some Amends for such Omission at the End of the Book, by proper References.

The Diseases I have herein particularly treated of, are but few, yet such as are of a rebellious Nature, and difficult Cure; and some of them so rarely occur, that my Country Brethren are often at a Loss to know how to manage them; and I hope therefore, that they particularly will kindly accept and encourage these Essays. And I was animated to this Undertaking, by the kind Reception a little Piece of mine has found in the World, called, Colloquia Chirurgica, which has passed two Impressions, and is now about to undergo a Third, with many proper Additions, and Alterations, and an Alphabetical Index, which it never had before, all which will make it more valuable, altho' the Price will be still the same.

I have (to make these Essays more profitable and pleasant) here and there inserted a remarkable History of some extraordinary Case, and an Alphabetical Index of the Contents; which if the Reader turns to, I doubt not but he will find such curious Things referr'd to, explain'd, and accounted for, as will give him great Satisfaction; and such as, if I should say he cannot meet with in any other Book, I should not exceed the Truth.

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As for the Regular Physician, (whom I verry much honour and) whose Learning and liberal Education sets him above common Helps, I humbly submit these Essays to his kind Censure, and put them under his Protection, and hope (at least) to have no Discouragement from him. And, lastly, I address myself to my Brethren, the Surgeons of Great Britain, whose Indulgence, Candour, and Good-nature, I ask with more particular Freedom, and Hopes of Success, than any others, for Reasons very evident to all; hoping that I have done nothing herein, nor in any other Way, to forfeit their Esteem, or the Character of a Surgeon, or an honest Man. But as no Man is without his Enemies, so I know I have some; and my Consolation is, that their Malice is impotent, and wholly without Cause; and they are such as are of the vilest of Men, and that have immers'd themselves in the very Dregs of Impiety; having put off the Human, and assumed the Brutal Nature; that mock at their Maker, stab their Neighbours Reputation in Sport, and, by unparallell'd Falshood, strive to murder his good Name in the Dark. Of these I ask no Quarter; and as I shall take no Notice of their malicious Reproaches, so I should esteem their Applause as a Scandal and Slur to my Undertaking; devoting my Labours wholly to Men of Integrity, Learning, Candour, and Humanity.

And

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And I beg this one Favour of my Reader, that before he reads this Book, he will be so kind, as, with his Pen, to correct the grosser Faults which he finds pointed at in the Errata, and the lesser, as he meets with them; and not make himself merry with the Mistakes, either of the Printer, or of his Freind and Servant,

JAMES HANDLEY.



THE



THE INTRODUCTION.



N Human Body is a *Machine* of such an excellent and elegant Composition, and every Part of it so *wisely* and wonderfully order'd, that in the whole of its Contrivance we may behold infinite Wisdom and Power, and some Rays of Omnipotence, shining quite thro' the Mechanism of that noble Creature M A N, To understand perfectly the *Texture* of whose Parts, is worth an *Age* of Study, a *Century* of Toil. For since Man, at first, not only lost the Favour of his Maker, but became the easy Prèy of Diseases and Death ; it cannot but be an unspeakable Blessing, to be Master of an Art capable to *prevent* or *conquer* the Attacks of the one, and postpone the Fear of the other, and *thereby* render a short Span (at most) tolerably comfortable, and for a time hinder that
slender

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flender Thread of Life from being cut, which would otherwise *often* very early divide, and send the Patient into *Eternity*.

To be sick, or in Pain, (whether under the Tortures of the *Stone* or *Gout*, or Scorchings of a *Fever*, or any other of the like Nature, *if any such there be*) is a State of *such Misery*, that we want Words to describe it; yet, *such* is our Unhappiness, that there are none of us, *no not one*, but at one Time or other, are expos'd to the *In-sults* of some one of them. What Honour then is due to *that Art*, whose only Design, Institution, and End, is Health and Ease? And which, if rightly understood, enables us, *very often*, to render fruitless the greatest Fury of the most frightful Disease, and to countermine the most vigorous Approaches of the *King of Terrors* himself, and (as it were) to beat him out of his own Intrenchments, who, without Medicinal Auxiliaries, had reduced the Patient to his primitive Dust, and given him Possession of a Tenement of Clay, *perhaps*, long before he was willing.

But to be able to understand *how* to do *this*, requires *more than Talk*. Circumstances of Diseases, in different Constitutions, as well as the different State of the Fluids, at different Times, infinitely varying, no general or certain Method or Rule can be applied to particular Cases, except we understand the *Reason* of that Rule; and we cannot understand that *Reason*, unless
we

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we make Observations upon the Structure of the Parts design'd for *Secretion*, with the different Nature and Use of the Fluids to be secerned, and the Laws of *Secretion* in an *Animal Body*; that is, unless we understand the *Animal OEconomy*, upon the Knowledge of which the whole Art of a rational Practice is built: If to it we add the Skill of drawing rational Indications from Causes, and Symptoms of Diseases, for a right Distinction of the several Species of the same Disease; and Prognosticks from Observations of the Effects of their Appearances, and a thorough Knowledge of the Manner *how* and *why* a Medicine operates upon any of the Juices: I say, without the Knowledge of these Things, a Man would undertake to rectify what he does not understand, altho' it is not *impossible*, but that in some Cases, a Patient *may recover*, under his *Prescriptions*, without this Knowledge, and (if he had not been very expeditious) so he would *without* his Medicines.

So have I sometimes seen, that when a Watch has stood still, an accidental Shake from an *ignorant Hand*, has set the *Movements* a going again; so there have been Examples, where a Blow on the Breast from an Enemy has broke an Impostume and sav'd the Patient's Life. *But* certainly, no *wise Man*, will *therefore* apply to the One to repair his Watch, nor make Use

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Use of the other for his *Physician* in the *like Case*.

Now, the Body of Man (like a Watch, or Clock) is subject to such Motions as are the *necessary Consequences* of its *Structure*; and all the Symptoms of Diseases are the *irregular Motions* of this *Machine*; and the *necessary Consequences* of the Alteration of its *Oeconomy*, and flow as *necessarily* from *this Alteration*, as those Actions which continue Health and Life, flow'd from the *Oeconomy* before *such Alteration*. But (as the late very ingenious Dr. Keill well observes) to understand the *Animal Oeconomy aright*, we must be careful not to suppose what has no *Existence*, nor lay down our own mere Fancies for *Principles*, and then make Conclusions from them; because, what has not a *Being*, admits of no *Demonstration*; and what cannot be clearly demonstrated, ought not to be receiv'd at all. Nor is it enough that we go upon *Principles* which are not *evidently false* or *doubtful*, but they must be such as are *demonstratively true*, or we shall never be at a Certainty in the Cure of any one Disease whatsoever; and where Life is concern'd, there ought to be an *unerring Rule* to guide us, or else there may be as many *Hypotheses* as Men, which, *all differing* one from the other, may be *all false*, or equally *uncertain*; and in the *Midst* of this *Uncertainty*, the *poor Patient* is but in a *very indifferent Case*!

We

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we should not *therefore* go upon a Possibility *only* of being in the *Right*, but upon a *Certainty* of not being in the *Wrong*, or our Practice is but *Empirical* at the best. If it was not for *these*, and such like Difficulties, the meanest of the People might be good Practitioners, a *Mountebank* vie with a *Graduate*, and every impudent *Bone-jobber* pass for an expert Surgeon, and be as scandalously *eminent* as *Fossill* himself.

But (*exclusive* of the *regular Physician*) there are but few that practice Physick *Rationally*; not knowing *why* they prescribe, as they do, only Custom and common Method; they having their whole *ars præscribendi* from *Recipe's* and a low *Education*: But, alas! what is this to the Knowledge they ought to have? For the same Medicine or Method that has cur'd *one Patient*, at *one Time*, will not cure another, (nor even the same) at another, in the like Distemper; the *Fluids* not being always in the *same State*, the Disease not *always* alike afflicting, nor complicated in the same Degree nor Manner, and so, by Consequence, not calling for the same Medicines nor Method; and *herein* lies the Difference between an ignorant *audacious Pretender* to Physick, screen'd with a *Diocesan License*, and a Man educated in the *Physical Way*, and that can account for what he does.

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Of the *Pretenders*, (tho' there are as many *Species* of this *Animal* as there are of *Monkeys*) I shall take Notice of but two of 'em : The first is the Spark with the *Corinthian Forehead*, who having got Master of some little Scraps of School-Boys *Latin*, is perpetually tossing it about in all Company, to make the Ignorant *Stare* ; ventures at all Hazards upon *every thing*, and warrants *all Things* he takes in Hand ; has a *Lessening Cant* for every Man of the Faculty, and is very full of *Innuendoes*, which are so plain, that every one may easily know who he means by them ; and if he happens to be call'd in just upon a *kind Crisis*, and the next Day finds the Patient *much better*, then he triumphs with, *Did not I tell you so ?* And the poor ignorant People not knowing what a *Crisis* means, think it's all owing to his *Prescriptions*.

The other Sort is he, whom the good Women *dubb* with the Title of, a *safe Man* ; that is, one, that if he does you *no Good*, will be sure to do you *no Harm* ; or one that takes your Money for doing *something* that comes to *nothing* ; and he is commonly chose to doctor Children, because he can submit to all the Nonsense of the *She-Relations* about *Little Master* ; not forgetting to fee the Nurse, and flatter her, as if she was Mistress of the Family : And as the former Sort warrants every
Thing,

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Thing, this Man, on the contrary, always pronounces *much Danger*, be the Case ever so *trivial*; so that if the Patient recovers, it is all attributed to this *safe Man*; (for wrong Prognosticks are easily overlook'd, when they happen on the right Side) and if the Patient dies, why truly, *it is but what the Doctor foretold*, so that he is safe either Way; and his Powder of Coral and Blackcherry-Water, (with the Help of a little unmanly Condescension) does as great Feats as *Aurum Potabile* is reported to do, and carries on the Fraud, *secundum artem*, to the End of the Chapter; and People love to have it so. But if these Men are ask'd to give a Reason for what they do, one may as well ask them to solve a *Problem in Euclid*.

But it is not *this Sort of Practice*, nor treading in the Steps of many of our *Forefathers*, who resolv'd what they could not account for into *occult Causes*, and so fate down content with their own Ignorance: Nor is it our having the Names of Diseases (and a Catalogue of Medicines) ready on the Tongue, that qualifies a Man for *Physical Practice*, unless he knows the true Cause and Nature of *the one*, and the Reason of the Operation of the *other*: Why *such a Medicine* is adapted to the Cure of *such a Disease*; *when* to exhibit it, *when* to alter it, or compound it with *others*, and *why*, &c.

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And this can never be done, unless he understands the *Animal OEconomy*, and is Master of the *Theory of Physick*.

Of the Necessity of which, I cannot better inform my Reader, than from the late very ingenious Dr. *Wainwright*, in his *Mechanical Account of the Non-Naturals*, p. 168, 169. “ It is past Doubt with me, “ (says he) whatever some Physicians say “ against Theory, (which they don’t under- “ stand) that ’tis not only useful, but a ne- “ cessary Qualification of a good Physician; “ for one that understands the Structure of an “ human Body, the Nature of the Solids and “ Fluids, the Manner how Animal Actions “ are perform’d, the Nature of Secrétion, “ the Effect of either increasing or lessening “ any Evacuation, the known Laws of Mo- “ tion, as apply’d to Mechanicks and Hy- “ drostaticks, with the Application of them “ to the Alterations made in human Bodies, “ is, cæteris paribus, better qualify’d for a “ Physician, than one who is ignorant of “ these Things, as too many who bear a “ great Character in the World are; “ which, for want of solid Reasoning, they “ maintain, by a supercilious Look and “ affected Gravity, whose Words ought no “ sooner to be taken for the Safety of any “ Medicine they prescribe, (for the Prescrip- “ tion of which they can give no Reason) “ than of a Mountebank upon a Stage, who “ will never fail of telling the People how “ many

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“ many Hundreds be has cur’d in all Distempers, &c.

If these *Essays* shall be of Use to *some*, and provoke *others* to a laudable Emulation, I shall think my Time well bestow’d ; but, *if not*, I shall have this Comfort resulting from my Labours, that I have endeavour’d to serve my Generation, according to the best of my Capacity, which ought to be every good Man’s End and Aim.

If any are so captious, as to ask what Business a Surgeon has to meddle in Physick, I answer, that Physick has ever been equally my Practice ; and so it is at this Day of many Hundreds of other Surgeons in the Nation, for whose Assistance (especially the young ones) this Piece now sees the Light : And we may as well ask what Business a Physician has to publish Books of Anatomy ? But I shall not ask any *such Question*, nor give any *such Answer*, because they would be both impertinent, but refer to the Book itself, which will tell the true Reasons to every ingenious unprejudic’d Man : From whom, for the Bookseller’s Sake, more than any Vanity of my own, I shall be pleas’d with a friendly *Euge* ; but setting *that* aside, I know the World too well to be fond of any of its Applause : Being now past my *Meridian*,

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dian, and drawing towards the *Evening* of my Days, and hastening apace to that quiet Mansion the GRAVE, where *the Weary are at Rest* : And if I can go thither in Peace, and with a good Conscience, it matters not much, what any Man says or thinks of me, be it ever so vile, provided it be not true, which shall always be my Care most studiously to prevent.



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AUTHORS,

*Whose Authority is made Use
of in the following TREATISE.*

A Vicen	Fuller	Piso
Areskine	Forestus	Parey
Aratus	Galen	Quincy
Avinzoar	Glisson	Quercetane
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Durtus	Lemery	Verheyen
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DesCartes	Newton	Walleus
Dedatus	Paracelsus	Welfchius
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THE Author's Absence from the Press, has been the Occasion of many false Pointings, and some false Folio's; as p. 186 and 187 twice; and then from p. 201 there is a Skip to 208; but as it makes no Breach in the Thread of the Argument in Hand, it has no need of correcting; so the Word Assimilate, Assimilating, or Assimilated, are often spelt Assimulate, Assimulating, or Assimulated; and Scirrhus is spelt Schirrhus; and many literal Mistakes have been committed, which the Reader is pray'd to correct as he meets with them. In p. 392, 393 there are some Mistakes, by the Printer's putting Figures (which were in the Copy) into Words at length, which are too long to be corrected here; but every Reader, with a Mathematical Head, will easily find out those Mistakes; and as for the rest, the following are the most principal.

ERRATA.

PAge 7. line 5. read Water Formes. p. 12. l. 39. r. 18. Gains. p. 20. l. 26. r. and. p. 22. l. 23. dele Satis. and l. 25. ald it. p. 32. l. 8. r. vasa deferentia. p. 33. line 29. r. morsus. p. 38. l. 23. f. Potifers r. Potiphera's Daughter. p. 71. l. 7. r. came. and l. 35. dele it is. p. 75. l. 13. f. its r. the. p. 80. l. 31. r. diliferous. p. 83. l. 16. r. anastomases. p. 90. l. 21. dele and touching. p. 94. l. 2. r. concha. p. 122. l. 5. f. his r. is. p. 124. l. 3. f. pull'd r. pall'd. p. 130. l. 17. r. increasing. p. 218. l. 25. r. nucus. p. 219. l. 4. f. in most r. inmost. and l. 28. f. of Balsams. r. of Balsamicks. p. 127. l. 19. r. grateful. and l. 20. f. five r. sue. p. 176. l. 21. r. thro'. p. 178. l. 5. r. Faculty. p. 179. l. 14. r. effect. p. 180. l. 2. f. are r. is. and l. 27. f. their r. the. p. 182. l. 29. r. they work. p. 184. l. 34. r. Palates. p. 192. l. 12. r. recen. and l. 20. r. seems. p. 193. l. 23. r. incide. p. 194. l. 6. r. cachetical. p. 208. l. 22. r. Flegm. p. 233. l. 21. dele the. p. 249. l. 25. r. ar. p. 250. l. 5. r. Ferment. p. 255. l. 25. f. every Medicine r. Ear-Medicines. p. 262. l. 2. r. they do. p. 276. l. 9. r. Feavers. p. 289. l. 25. f. is. r. are. p. 294. l. 8. dele the first is. p. 301. l. 35. r. alii. p. 310. l. 18. f. joynted r. joyned. p. 315. l. 25. f. de vto r. de novo. p. 323. l. 2. f. cannot r. can. and l. 23. r. Seminale. and l. 33. r. Venereal. p. 341. l. 30. r. return'd. p. 367. l. 14. r. Commi-nution. p. 372. l. 2. r. flow. p. 399. l. 15. r. he. p. 406. l. 14. r. Dr. Fuller. p. 414. l. 24. f. botter r. better.



Mechanical ESSAYS

ON THE

Animal Oeconomy, &c.

Of the BLOOD.

Its Mechanism.



THE Blood being the principal Fluid, we shall first treat of that; and *explicate* how it is formed of *Chyle*, when we come to speak of *Sanguification* and *Nutrition*; and shall here observe, that Blood is the Life of the Animal, and consists of two Parts, *viz.* the *Crassamentum*, or red coagulated Part, and a *Serum*; the last of which, being the *heaviest* of the two, bears up the red Part, in its *fluid Ocean*, after *Phlebotomy*.

The *Serum* is supposed to be in Proportion to the *Crassamentum*, as One and an Half is to One; but this is not without its Uncertainty.

A

The

The Heart is *as* the Sea, to this *Microcosm*, or little World, *Man*: The Circulation of the Blood, is *as* the *Flux* and *Reflux* of the Tide: The *Passions*, are the Storms and Tempests: The *Arteries*, that carry the Blood, from the Heart, to all the other Parts, are the *Subterraneous Channels* that come *from* the Sea; and the *Veins*, which bring back the Blood *to* the Heart again, are the *Rivers* and *Rivulets*, that carry it *to* the Sea again. So that the *little World*, as well as the *Great*, is divided into *Sea* and *Land*; the *Fluids* being *as* the *Waters*, and the *Solids*, *as* the *dry Land*.

And altho' all the Parts of the Body are nourished *from* Blood, or that which is secreted *from* it; yet *not* by the red grumous Part, *but* by the white and *serous*; from *which* is *fabricated* the Bones, and all the Solids, which receive all their Nutrition and Increase from *that* Fluid, which, after its Separation, becomes *heterogeneous* to the Blood. The *florid* Part is *rather* fitted to maintain Heat and Motion in the Vessels, than qualify'd for the Nutrition of the Solids, it having a third Part more of *fixed Salt*, and *Crassamentum* of Earth in it, than the *Serum* has.

The nutritious Juices mix with the Blood, and circulate with it, thro' all the Parts of the Body; and in their Passage, the excrementitious Parts are separated into *specifically distinct Fluids*, by the *Glands*, whose Pores are fitted to receive such Particles *only*, as (when they are assimilated) make *such* a peculiar Kind of *Fluid*.

As for Example: The *Urine*, which is *secerned* by the Kidneys; *Bile*, by the Liver; *Saliva*, or *Spittle*, by the Glands of the Mouth, &c. so we may reasonably conjecture, that the Pores of the Parts to be nourished, are by Nature *so* formed, as to receive and retain those *peculiar* Particles, which

which agree best in Figure with them. By a *Microscope* may be seen, in *one* Drop of Blood, many Sorts of Particles; some *long* and *pointed*, others *small* and *globular*; some of three or four Points; but amongst the globular ones, few are *spherical*, but more of them of an *oval* Form, and others that give an Unevenness to the *Superficies*.

Blood remains *fluid* by *gentle* boyling, but grows thick by *violent* Heat, and acquires a brown Substance, like *Liver*, altho' we continually stir it: From whence we may infer, that in *some* Degree it does the *same* in *burning* Fevers, which so often kill the Patient.

Diemerbroeck says, that the Blood is composed of a *saline* and *sulphureous* Juice, and *Serum*; the *sulphureous* is somewhat greazy, oily, and *viscous*; which is the Cause that, in *Dissolution*, it will not so well mix, without some Loss and Noise, except there intervene *some* Mercury, which is so familiar to the Nature of the one and the other, that both their Powers are exactly mixed *with* it, and *in* it; for this Mercury is the same *Serum*, in which, by the Means of Boyling, the more watery Particles of the Juices are dissolved, and mixed together.

Likewise the *Serum* is composed, not only of the *aqueous* Part of the *Aliment*, but also of some *sulphureous* and *saline* Parts, *blended* in *Fusion*; so it partakes of a Temperament between *both*, in *such* a Manner, that the Mixture and Union of the two Juices is made of a good Texture *therefrom*: And it is for *this Reason* that it should be well concocted, and mixed, with a due Quantity of other Juices; for if it is in *too small* a Quantity, or that it wants its active Principles, *viz.* if the *saline* and *sulphureous* Juices unite *too strictly*, they act with *Violence*, and oppose one another

4 *Of the Blood. Its Mechanism.*

ther, and by this Struggle, they break in sunder, and consume, by Way of *Colliquation*, from whence the Body wastes, and grows lean, being deprived of its *Aliment*, or else it *corrupts*, and becomes *morbifick*: And, on the contrary, if the *Serum* is *crude*, or in too great Plenty, then the *same* active Principles separate themselves, and are too remote *from*, and cannot support one another; whence the Blood is too moist, and subject to Corruption, and the Body being nourished by *such Blood*, must needs be weak and languid, &c. These two Juices mix together in the Mass of Blood, from whence they are raised by *Fermentation*, and being, from Time to Time, carry'd with it to the Heart, and many Times attenuated and dilated together, they are united *so exactly*, that at last they become entirely *one Spirit*, which we call *vital*; which Spirit is the *most subtile* Part of the Blood, composed of the said *sulphureous* and *saline* Particles, dilated and united together by the Fermentation which is made in the Heart.

The *vital Spirits* form themselves thus: The Blood, that is in the *Vena Cava*, enters the right Ventricle of the Heart, where it is warmed by the Heat and Motion of *that* Part, which is the hottest of all the whole Body; and after *that*, it flows *smoking hot* into the Lungs, where it meets with the Air, that is brought by Inspiration; which, by its Coolness, and Density, separate and *exhale*, after the same Manner as is done in Distillation, in those Stills, where cold Water is placed round the Receiver, to condense the Vapour into a Body; *for which Reason*, the Vein that carries the Blood *smoking* into the Lungs, is as *thick* as an *Artery*, to hinder the Disposition that might be made before it cooled: And, *on the contrary*, the Artery which receives the
Blood

Blood after it has been cooled, is as thin as a Vein; and probably this is the Reason, why this Artery has but two Valves, instead of three, which all the other Vessels have that enter the Heart.

And now we are to mind, that the efficient Cause of all the vitiated Fermentations, is the vital Spirits; but the material Cause, is the Fault of the Contexture and Harmony of the small saline, and sulphureous Particles of the Blood; for when these Particles are not well tempered, they become acrid, make a stronger Effervescency, and contend with greater Violence, as in burning Fevers, Pleurisies, Measels, Small Pox, &c.

Willis will have it, that the Blood has five Principles, viz. Spirit, Sulphur, Volatile Salt, Earth, and Water: The Spirit agitates the Blood, and keeps it in a due Temperament, and makes it truly Homogenous: Sulphur is the oily or greasy Part of the Blood, and is confused amongst the rest, but smoother: The volatile Salt hinders its Crudity and Corruption, except when it is too strong, as in the Scurvy and Quartane Ague; or too sharp, and more apt for Coagulation, as in the Gout, Leprosy, &c. and the Water gives it its Fluidity and Coolness.

Some that have taken the Pains to analyze the Blood, tell us, they have found it to consist of Salts and Oil, which have, by curious Examination, been found to consist of Pblegm, and a Caput Mortuum, out of which they produced, by Incineration, a little fixed Salt.

It is capable of Coagulation and Dissolution: If it could coagulate within the Body, it must be directly mortal; but this never happens, unless it be procured by Art.

Dissolution is a Commintion of the Fibrous Parts of the Blood, which so breaks and alters its Texture, as to turn it all to Serum, leaving no

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Crassamentum in the Porringer; and this Dissolution is commonly the Consequence of malignant Fevers, that shew themselves in purple Spots, bloody Urine, &c. as also, of the Bites of Vipers, and some other venomous Animals, and in a *Diabetes*, &c. And altho', in a sound State, the Blood, when received into a deep Vessel, or Porringer, will separate the *Serum* from the *Crassamentum*; yet, if it be received upon a *Plain*, there will be no such Separation at all.

If the Blood abounds with too much oily or salt Particles, the *Solids* thereby become too much lubricated, and their Spring relaxed, from whence proceeds that *Inactivity* and *Drowsiness*, so incident to fat People.

And, on the contrary, a Defect of this Oil, is the Cause of *Leanness*, *Atrophies*, *Apostemations*, *Ulcers*, &c. especially of the Lungs.

As to its florid Colour, altho' many Authors have offer'd their Reasons, how to account for it, none, as yet, seem (at least to us) to carry a *Demonstration* with them; so that when every one of them has said all he thinks fit, it seems to be only *gratis dictum*.

Some say, that the Air it receives in the Lungs, gives it that glorious Red; because the Air turns it florid in a Porringer, when taken away in *Phlebotomy*.

Others would account for its Colour, from its great Agitation in the Lungs, which (they think) is sufficient to give it that agreeable Florid.

The Chymists tell us, it proceeds from its exalted Sulphur; and others, that as the Blood is composed of very little Globules, the Redness and Liquidness depends on them, and their Motion: For, say they, it is not probable, that these Globules are of that Colour, (altho' they appear red) if we observe them apart, for then they look as transparent

transparent as Chryſtal: They are not then red of *themſelves*, when ſingle; but whenever all of them are together, the Light which runs *acroſs*, breaks itſelf under *certain Angles*, which make it appear red, after the ſame Manner as Waters form the *Rainbow*, when the Light falls *thwart* it.

The *globular Particles* of the Blood may ſeem to contribute to its red Colour, yet it cannot depend on that *only*; for they are frequently ſeen in Milk *as well as Blood*, and what deſtroys the *Redneſs* of the Blood, does not *always* deſtroy its round Particles.

If we mix *human Blood* with Syrup of Violets, and it turns the Serum *green*, it is a Sign that an *Alkali* abounds; and on the contrary, if it turns it *red*, or purple, an *Acid* is *predominant*: This, ſome affirm, but how truly, we know not; for Mr. Boyle has prov'd, that there is nothing of an *Acid* in human Blood, &c. and Dr. Pitcairne has ſhewn, that the *Acid Subſtance* of Vegetables taken into the Stomach, are, by the Action of *that Part*, and of the Lungs and Heart, (when they come into the Blood-Veſſels,) turn'd to *Alkalious*, ſo that the arterial Blood muſt needs be an *Alkali*, if their Doctrine be true.

But there are others who, *with like Assurance*, ſay, that if the *Acid* and *Alkali* are too much remov'd from the natural Conſtitution, and that the one acts entirely upon the other, it almoſt deſtroys the Fermentation; for if the *Acid* prevails, the Maſs of Blood is coagulated, and *ſin-copes*, and ſometimes Death is the Conſequence; and if an *Alkali* abounds, the Blood is eaſily diſſolv'd. But, to let this *knotty Difficulty* alone to thoſe who have a Delight in ſuch Controverſies, we ſhall leave this old Note with our Readers, *humanum eſt errare*: And we refer the Curious to the following Experiments, to make Conclu-

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sions accordingly, (*viz.*) Spirit of *Nitre* gives the Blood a darkish white Colour ; Spirit of *Vitriol*, a *Black* ; Spirit of *Salt* gives it a *mix'd* Colour, inclining to an Ash-colour'd Yellow ; Salt of *Lead* makes it thicker and paler ; *Vitriol* gives it a dirty Ash-colour ; Salt of *Steel* changes it less ; Sea Salt and *Nitre* makes *dark-colour'd* Blood *redder* ; and in a measure hinders its *Coagulation* ; and *Alkalious* Salts do the same more effectually. And from *hence* we may collect, that those Medicines which make an Alteration in the Colour of the Blood, alter its *Crafsis* also ; and therefore ought to be used with Caution, and not too liberally : Or rather those of a contrary Nature : That is to say, if the Blood is too black, not to give Spirits of *Vitriol* ; but if an Acid is thought proper, (rather) the Spirit of *Nitre* or of *Salt*, &c.

If to the *Serum* of the Blood we put Spirit of *Nitre*, or *Allum*, *burnt* or *crude*, it turns to a white Curd, and *more so* with the bare Addition of *Allum*. Spirit of *Salt* makes it more *limpid*, Spirit of *Vitriol* *black*er. If the *Serum* be boil'd, it becomes of a white Colour, and of the Consistence of the White of an Egg, almost hard boiled ; and will curdle by putting in *Allum*, and grow *milky* with Spirit of *Nitre*. Spirit of *Salt* or *Vitriol* added *with* *Allum*, prevents the Effects of the *Allum* ; and if the *Allum* *has* already curdled it, these Spirits will dissolve it : But Spirits of *Nitre* and *Allum* *always* perform the same Thing alone, or apart.

Fixed Alkali Salts prevent the Effects of Spirit of *Nitre*, and will dissolve a *Coagulation* made by *that Spirit*, and render the Mass *limpid* again ; which is a Note *well worthy of Observation*.

Altho' it has been held as *certain*, that there are Communications of the Arteries with the Veins, by *Anastomases*, yet that *Hypothesis* is now
justly

justly exploded, because it appears *false*, both from the Situation of the *Valves* in the Veins, and also from *hence*, that if we inject warm Water into the Artery of the Arm of a dead Body, and afterwards make a Ligature on the Vein that accompanies it, and then puncture *that Vein*, we shall find that the Water will *not* flow, altho' all the Arm and Hand were filled with it: And then, if an Artery be syringed with *red Wax*, and at the same Time the Vein, that answers to that Artery, has an Injection of a contrary Colour cast into it; you will see, *with Pleasure*, all the Capillary Branches, and the Substance of the Part penetrated with the Wax, *but will not anywhere find the two Injections mixed together*.

AGAIN: Upon making a Ligature upon the Arm or Leg of a *living Subject*, it swells underneath, because the Blood which is *pulsed* forwards by the Arteries to the *extream Parts*, returns by the Veins, and mounts *upwards*, and stops at the Ligature, and swells the Vein *below*; and finding a *full Stop* at the Ligature, it is *forced* to flow thro' the Orifice; and as soon as the Bandage is loosed, it *ceases* to flow, because it has an easy Passage thro' the Vein; and if the Ligature is made *so tight*, that the Blood cannot pass into the Parts from the Artery, it *ceases* to bleed, *because* its Motion thro' the Artery is *stopped*; but upon loosing the Ligature, it will bleed *afresh*.

The Arteries being ty'd, *swell* above the Ligature, and the Veins *flag*, because the Blood readily flows *from* the Ligature, and returns to the Heart, and swells *below* the Ligature.

It is a common Assertion amongst Anatomists, that the *Ventricles* of the Heart, of a moderate Size, will contain *each of them* two Ounces of Blood; from whence they conclude, that *so much* is expell'd from the Ventricles at every *Pulsation*: But

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as the Measure of the Ventricles *cannot* be taken, but in *dead Bodies*, in which the Parts are *shrunken*, and as it is *probable* that the *whole* is not driven out at *every* Contraction of the Heart, hence it may be objected, that *so much* is not *expulsed* at every *Systole* of the Heart; therefore we will suppose, that only *one* Ounce is sent from each Ventricle *at a Time*, and then it will follow, that every Hour there passes thro' the Heart (reckoning 50 Pulses in a Minute) at least, three thousand Ounces of Blood, which makes 250 *Physical* Pounds, of 12 Ounces each: And *supposing* that every Man contains in him only 15 Pounds of Blood, (which some will have to be 25) then the *whole Mass* ought to pass thro' the Heart 16 Times in an Hour: And *if* there is not above 12 Pounds of Blood in the Body, then 20 Times in an Hour.

The Blood of the Arteries, when arrived in the Lungs, is *so* perfected, that *that* which is carried to the Brain, is for the producing *Animal Juice*; that which goes into the *parotid* and *maxillary* Glands, for the Separation of the *Saliva*, or Spittle; into the Glands of the *Oesophagus*, and Stomach, for an acid Liquor; into the *Pancreas*, for pancreatick Juice; into the Liver, for *Bile*; into the Kidneys, for *Urine*; into the Testicles, for *Semen*; into the Breasts, for Milk, &c.

Chyle circulates thro' the Body several Times, before it is assimilated into Blood, yet it does not pass into the Nourishment of the Parts, in the Form of *Chyle*; and altho', where we shall treat of the Nourishment of a *Fœtus* in the Womb, we say, it is done by a *Succus Nutritius*, (which is only *Chyle* a little alter'd) we do not call it *so*, with respect to the solid Parts of the *Fœtus*, but to the Blood itself; whose *Pabulum* it is, as soon as the umbilical Vein is formed, as the
Blood

Blood is of the Body; for as to the manner of the Increase of the first delineated Parts of an imperfect *Embryo*, it differs very much from ordinary Nutrition.

The Blood consists (then) of Particles of a different Nature, each of which pass into the Nourishment of that Part which is of the same Nature with itself; the *salt* and *sulphureous*, being equally mixed, are *assimilated* to the fleshy or musculous Parts; the *oily* and *sulphureous*, to the Fat; the *salt* and *tartareous*, to the Bones, &c. not by Election, or Attraction of the Parts, but there is such a Diversity of Figure, both in the Particles of the Blood and Pores of each Part, that in Circulation some stick in one Pore, and some in another, according to *such Configuration*, where they unite to the Substance of the respective Parts; and those that, by their particular Configuration, cannot adhere to *any Part*, return again to the Veins, and so to the Heart, where they receive *some* new Alteration, 'till they are fit for Nutrition of one or other of the Parts.

Tho' the *Canals* and *Liquors* of *all Men* have the same common Properties, yet the Blood of *all Men* is not compounded of *equal* Parts, *equally* round, smooth, or the like; for then *all Men* would be of the same *Temperament*, and *equally* healthy, which they are not; and hence it is, that some are disposed more to one Action, or Disease, than to another.

And if we strictly enquire into the first Original of the Blood, we shall find, (as was hinted before) that in its Infancy it is *pellucid*, and has not anything of Redness in it. That Redness being the Effect of a Progress of Digestion, and *Mixture of Parts*, by the Addition of Heat, which is maintained and increased by the Reception of Air that passes thro' the Pores by Respiration, is to us very probable.

Dr. *Wainwright* says, “ He that tries, shall find,
 “ that a Solution of *Sublimate* will curdle the Se-
 “ rum of the Blood *white*; Filings of Copper
 “ turns it, in a Day’s Time, *ceruleous*; a Solution
 “ of *Turnsole*, *green*: All which, shew it to be
 “ fraught with a predominant *alkalious* Salt; and
 “ from whence we justly infer, that whatever
 “ nourishes, must be of an *alkaline* Nature; and
 “ nothing stands so fair for it, as *Flesh*, Gellies,
 “ Soops, &c. all which afford a great Quan-
 “ tity of an *oily Alkali*: But vegetable Food is
 “ not only more viscid, and requires more La-
 “ bour from the Stomach, to make the Parts of
 “ it small enough to enter the *Lacteals*, but it is
 “ also stocked with acid Particles, which, by the
 “ Stomach, Lungs, and Heart, must be converted
 “ into an *Alkali*, before it be fit for Nourishment.
 But this I leave to be consider’d and compar’d
 with what is said above by Mr. *Boyle*.

And here I shall close my Subject, by repeat-
 ing an Experiment made by Dr. *Vieussens* of *Mont-
 pelier*, and communicated to the College of Phy-
 sicians at *Paris*:

“ Take (says he) 50 Pounds of Man’s Blood,
 “ dry and calcine it in a Potter’s Oven for 24
 “ Hours Space, and there will remain about 3xxij
 “ 3vij of an *Alkaline* Powder, that ferments with
 “ Acids, and gives a green Tincture to the Tin-
 “ cture of Mallowses, or any other sulphureous Li-
 “ quor.

“ By a *Lixivium* you may extract from it 3j of
 “ white fixed Salt, that ferments with all acids,
 “ precipitates corrosive Sublimate, and tinctures
 “ the Syrup of Violets *green*: He says he took
 “ of it 3vij and xlij Grains, and mixed it with
 “ 3iij of the dryest *Bole-armoniack*, and from this
 “ Mixture, on a Reverberatory Fire, he drew 3ss
 “ and about xvij of a Spirit, in Colour resem-
 “ bling

“ bling that of Sulphur, and in Taste sharper
 “ than the Spirit of Vinegar : The Spirit he fer-
 “ mented with the Oil and fixed Salt of Tartar,
 “ and likewise with the fixed and volatile Salts,
 “ and with redish Spirit of Blood: It tinctured the
 “ Syrup of Violets, and *Turnsole*, and the Tincture
 “ of Mallowses with a red Colour; and from what
 “ remain’d in the Retort, he extracted by a *Lixi-*
 “ *vium* Sifts of greyish white fixed Salt, which
 “ fermented with no Acids except *Ol. Vitrioli*, but
 “ precipitated the corrosive Sublimate, and gave
 “ a green Colour to sulphureous Tinctures.” From
 all which he concludes, that the Salt of Blood
 is a *saltish* Salt, partaking both of Sharpness and
 Acidity : But this may be doubted; for, so large a
 Quantity of Blood, which he calcin’d, must needs
 contain a great deal of Sea Salt, which every one
 knows does not change in our Bodies; and this be-
 ing a fixed Salt, might remain last in the calcined
 Blood, and be the Author of *that Acid*, which he
 extracted with the Bole-armoniack, after the Man-
 ner that common Salt, mixed with Bole-armoniack
 in a Retort, yields a Spirit of Salt: So that
 this Experiment does not *effectually* prove that *this*
Acid was before existent in the Blood, but rather,
 that it was produced by Mixture and Distillation
 with the Bole-armoniack; or else, during the
 Calcination, the Acid of the Air might incorpo-
 rate with the tart *Alkali* of the Blood, being cal-
 cin’d in an open Fire; or else, lastly, the Fire
 might furnish the *Acid* that join’d the calcin’d
 Matter: For Fire is so far from turning *acid* or
 saline Salts into *Alkalies*, that it commonly disen-
 gages the Acid from the Alkali, or rather produ-
 ces an Acid, with Effects equal to those of the
 most violent Acids. But those that have more
 Leisure and Curiosity, may enquire farther into
 the Nature of this Experiment, for at present I
 shall

14 Of Phlebotomy. *Its Use and Abuse.*

shall leave it just as it is, and from the Nature, Quality, and Principles of the Blood, shall proceed to discourse of Phlebotomy.

Of PHLEBOTOMY.

Its Use and Abuse.

PHLEBOTOMY is not to be used by way of Prevention, in *very hot or extream cold Weather*; because, in the *first*, all farther Evacuations increase the Expence of Spirits, and in the *latter*, diminish the natural Heat.

Bleeding in the Morning is most proper, *because* the Recruit of Spirits, by the preceeding Night's Rest, renders the Patient more capable to bear it.

The Custom of bleeding *often*, or upon every flight, or no Occasion, is most certainly *pernicious*; for, as we observed before, the Blood is the Life, and *often bleeding* weakens the Constitution, and brings on old Age apace.

It is commonly forbid to sleep *after bleeding*; but the *only* Danger that's in it, is the Fear of bleeding *afresh*.

It is very dangerous to draw in its Steams by Inspiration, when it is just taken from a distemper'd Body; and to taste it, is *very filthy*, and of little Use, any more than to amuse the *Patient*, and to bring him into a better Opinion of his Surgeon than he *really* deserves; altho' *some say* that the sweet tasted Blood is best, the *salt, bitter, or acid*, indicating its Depravity.

If the Blood, after it is cold, is *entirely* liquid, and has no *Crassamentum*, it shews *Corruption*, and a total Separation of its Principles, and that its Texture is broke, &c.

And

And on the contrary, if it is one entire *Coagulum*, it is a Sign of Deficiency of Spirits, and tends to a *Stagnation*, and ought to be brought to a State of greater *Tenuity*.

In all malignant Fevers, Small Pox, Measles, &c. I cannot help thinking, that bleeding is *absolutely* to be *forborn*; because it prostrates the Strength, and draws the morbidick Matter *into* the Veins, which Nature had before cast out from the *Center* to the *Circumference*: For in *this Case*, the Blood must be treated like a *boiling Pot*, not to be cooled by taking out the Liquor, (for that would make it to boil faster) but by putting cold Liquor into it, or *rather* by abating the *Fire*, (as was once well observed by a noted Author, tho' of no great Reputation for Integrity.)

And as for Bleeding in the Small Pox, how much soever it has been, and now is, in vogue with the greatest Physicians of the Age, we think, with *him*, it is *directly contrary* to all the Indications of Cure; and sad Experience has shewn it to be *very fatal* to most to whom it has been administer'd. It calls in the morbidick Matter *into* the Blood, which Nature was casting *out*, and thereby corrupts the *whole Mass*, and so im-poisons the *Central Parts*, stagnates the bloody Juice, and suffocates the *vital Flame*. It hinders the Protrusion of the *Pocks*, prostrates the Strength of the Patient, and abates the Fever, *which should be kept up*; for the more languid the Heat, the more Danger; and if the Fever goes off, or *suddenly* abates, the Patient *commonly* dies; but if the Fever be let alone, 'till Nature has made a particular *Protrusion*, for want of Fuel, it will cease, without the Help of any Medicine, and the Patient will *generally* recover. As for my own Part, I must say, that considering the fatal Consequences of Bleeding, *common* in this Disease, I think it *very destructive*.

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structive, or at best *unsafe* Practice: I never in my Life caused any such to be bled, that was my own Patient, (except one) and he dy'd; and the Case was thus: When the present Emperor went first to *Portugal*, to attempt that Way to recover the Crown of *Spain*, I was Master-Surgeon of the *Suffolk*, a Ship of War of 70 Guns, and had several Passengers on Board, and amongst the rest, the Hon. Brigadier *Harvey*, one of whose Retinue was taken ill of a Fever, which at that Time was very rife in the Ship amongst the Seamen, but none had been ill of the Small Pox; wherefore I order'd him, as I had done others that were seized with that Fever, to be bled; soon after which the Small Pox appear'd; and tho' he had double Care taken of him in every respect, yet he dy'd: Upon which, no less than *nine Sailors* were at once seized with it, *none* of whom were bled, and *they every one liv'd* and did well; which to me has been a Caution ever since, and ever will.

Barbet directs against Bleeding in all *Pestilential Fevers*. "The *French*, (says he) *Italians*, *Spaniards*, "and *Portuguese*, (great Blood-letters) I expect "will tell me, that Nature, by Bleeding, when "she has had Vent, and is somewhat discharged, "shall be better able to throw out the remaining "Evil: And this does (as it were) seem to be "true; for the Blood indeed receives Air, that "the Spirits may the better fly away, and is "robbed of that Strength which it so necessarily wants, whereby Nature exchanges the Life "of the Patient for Death, and extorts Tears from "the By-standers. Without alledging other Reasons, they ground themselves upon *Experience*; "and it were to be wished, that they had that "Ground indeed; for we find such Patients of "theirs, who, *in the Morning*, were in no Danger, "even

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“ even after the taking away of but five or six
“ Ounces of Blood, to be cold and stiff at Night ;
“ whence it may easily be collected what it is
“ they call *Experience*, viz. If the Patient by Chance
“ escapes, then Bleeding must have the Honour
“ of it ; but if they die, (as for the most part
“ they do) then the Malignity of the Disease was
“ the Cause of it : Wherefore I alledge Experience
“ against Experience, and praise God Almighty,
“ that he hath vouchsafed to furnish all those,
“ who without Envy, Passion, or slavish Depen-
“ dence upon others, will duly consider Diseases,
“ with *surer Means*. Others proceed yet farther,
“ and shed innocent Blood in all Sorts of Fevers,
“ without any Consideration of Spots of the
“ Plague, or of the Poison itself.

Again, “ I do intreat all Practisers of our Art,
“ that as they love the Quiet of their Mind or
“ Soul, they would beware of Bleeding in *Pesti-*
“ *lential*, or other *malign* Fevers ; as also in all
“ Cases which may befall People by Poyson, either
“ inward or outward.

Galen de Humoribus, lib. 1. com. 12, says, “ That
“ in *Febres continentes*, wherein the Fever coming
“ does continue at the same Greatness, &c. we
“ must be exceeding careful not to take away any
“ Blood from the Body.

He says also, “ Happy are they who fall not
“ into the Hands of such unlearned Doctors, who
“ prescribe Receipts by *Hap-bazard*, and, as it
“ were, casting of Dice. And the same *Galen*,
“ *Meth. Med. lib. 9, cap. 13*, says, “ If we endeavour
“ to cure any Disease which requires Evacuation,
“ or Bleeding, it must be when they have attain-
“ ed so much Strength, that Bleeding will do
“ them no Hurt. And *Celsus* says, To let Blood
“ in the Fit of an Ague or Fever, is to kill the
“ Patient.” And *Fernelius, de abditis rerum Causis*,

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lib. 2. chap. 12, says, " In the Pestilence we must
" abstain from Bleeding, and strong Purging, for
" all the Danger and Mischief arises from a ve-
" nomous or malign Quality; such Things there-
" fore are to be prescribed, as do not evacuate,
" but which do, by gentle cooling and astringing,
" stop the violent Motion of the Spirits, Blood,
" and Humours, such as are *acid* Things, and
" which, by the Property of their whole Substance,
" weaken the Force of the Poyson, or expel it by
" Sweating, for these are the Antidotes for this
" Disease, &c." And *Doleus*, in his *Encyclopædia*
Medica, lib. 4, cap. 5, says thus, "*Willis*, in the Cure
" of, this most violent Disease, very seldom or
" never admits of Bleeding, because the Stock of
" Blood being too much exhausted; Sweating is
" not so easily promoted: As to the Chirurgical
" Remedies, Bleeding comes first to be consider'd,
" which is wholly to be omitted in malignant Fe-
" vers, because it renders the Blood more sharp
" and *fluid*. And it is certain, that by Bleeding,
" the Fermentation of the Blood is increased, to
" the Destruction of the Patient: Wherefore, I
" very much wonder the famous Practitioner *Sy-*
" *denham* has approved of it in these Diseases, &c."

Of Sanguification and Nutrition.

THE Stomach being made up of muscular and membranous Fibres, with Veins, Arteries, Nerves, and Glands, a *viscid* Matter is separated from the Blood, and emitted into its Cavity; which, if *increased* or *lessened* in *Viscid*ity or *Quantity*, is the Cause of Loss of Appetite, Vomitings, &c.

The Stomach, assisted by its muscular Fibres, with the Muscles of the *Abdomen* and *Diaphragma*,

is

is enabled to squeeze and pound the Food it receives ; which being mixed with the Saliva, and a Liquor supply'd from Glands in the Stomach, at length it becomes so uniform and small, that it passes over the *Pylorus* into the Intestines, where, in the *Jejunum* and *Duodenum*, it mixes with the *Bile*, and *Pancreatick Juice*, brought thither by the *Ductus Choledocus*, and *Ductus Pancreaticus* ; then passing thro' the other Intestines, the grosser Part passes away by Stool, and the most refined, called *Chile*, is for our Nourishment, and passes thro' the *Lacteals*, into the Mass of Blood ; which *Lacteals* are more numerous in the *Jejunum* than any other Intestine, and spread themselves all over the *Mesentery*, in whose *Basis* there are Glands, in which these *Lactea* terminate ; and the *Chile* is received by the second Sort of the *Vena Lactea*, and convey'd to the *Receptaculum Chyli*, from whence it rises thro' the *Ductus Thoracicus*, to the left *Subclavian Vein*, and so glides on to the descending Branch of the *Vena Cava* ; after that to the right *Auricle*, and then to the right *Ventricle* of the Heart ; whence it is expell'd into the *Aorta*, and so passes along with the Blood by the Arteries, thro' the whole Body, and returns again with it, by the Veins, to the Heart, and undergoes many Circulations before it be turned into pure Blood ; but receives some Alteration every Time it circulates, till at length all its Mass (that is capable of being turned into Blood) is sanguified, and what is not, is discharged by Urine, Stool, Sweat, &c. The Blood being thus made, the Body is nourish'd by it, by passing thro' the *Capillary Arteries*, to the Substance of the Parts, on whose Nourishment Part is spent, and the rest imbibed by the Mouths of the *Capillary Veins*, and return'd again into the circulating Mass. Now Digestion and Secretion being performed by *Muscular Motion*, whatever

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retards *that*, hinders Digestion, and by consequence prevents Nutrition. And altho' an increased Quantity of Blood helps Digestion, by giving a *Springiness* to the Muscles, yet the Quantity of the Blood may be *so* increased, as to abate the Strength, because an *Equilibrium* between the Blood and Vessels ought to be maintained.

Perspiration, *suddenly* suppresseth, augments the Quantity of Blood, yet it *diminisheth* Strength; and the Reason is, *because* the Matter, so retained, *so* alters the *sanguineous Texture*, as to make it unfit for muscular Motion.

Now, in order to *Nutrition*, it is absolutely necessary that the Food be so pounded in the Stomach, that the greatest Diameter of its fine nutritive Parts be less than the Orifice of the *Lacteals*; and some Anatomists tell us, that by *Microscopes* they discover Vessels in an human Body, whose Diameters are 79200 Times less than an Inch; and so small (at least) ought the Diameters of the *Lacteals* to be, otherwise, what passed thro' them, could not pass thro' other Vessels, but would lodge, and cause great Disorders, (if of undissolvable Matter, as Stones, Minerals, &c.) at last Death itself.

From hence we may learn how necessary it is, that Steel, and all other Minerals, and even the *Testacea*, should be finely pulverized; for if they are not, they *only* operate, or act, in the *primæ Viæ*, and do not at all correct Acids in the Blood.

Chalibeates, Bitters, and Emeticks, very much help Digestion, both by strengthening and contracting the *Fibres*, and *thereby* helping *muscular Motion*, and also by lessening the Quantity of viscid Matter, separated in the Glands of the Stomach; the last of which (*Emeticks*) more particularly do, and the two former more directly increase the Blood's

Blood's *Velocity*; whereby it is better fitted for *Secretion* of perspirable Matter.

The Fibres of the Stomach being *too tense* and springy, is the Cause that there is often tormenting Heat, Pain, Sicknefs, and Thirst; and yet the Stomach, at the same Time, is not able to endure the most balmy Liquid without vomiting: Add to this, that the Orifices of the Glands are by this Means contracted, by which the Stomach is robb'd of a great deal of the *Mucus* that should defend it.

The Blood being in a *viscid* State, its Motion is impaired, and the Orifices and Coats of the Glands will be relaxed, which will make the viscid Secretion greater than the Fluid, which is often the Cause of Loss of Appetite, Thirst, and Foulness of the Tongue, and that Hoarseness which is often observed in a Consumption.

“ The continual Waste which constant Motion
 “ makes in the Constitution, would soon wear the
 “ Body quite out, were it not for proper Supplies,
 “ and the *Attritions* and *Abrasions* of the circulating
 “ Fluids, would quickly carry away the Canals
 “ in which they circulate, were not somewhat
 “ furnished in their Composition, which is suited
 “ to fall into, adhere with, and recruit that which
 “ is washed off. And those Particles must be
 “ much more disposed so to do, whose Adhesions
 “ are greatest, when once they come into *Contact*;
 “ such are those Bodies we call *glutinous*, and
 “ which easily form themselves into Jellies, and
 “ such like Consistencies; for the Parts of such
 “ Bodies are very light, by the over Proportion
 “ of their Surfaces to their Solidities, whereby
 “ their Motions are both more languid, when
 “ in Circulation, and when they stop, their Co-
 “ hesions will be much the stronger, with what-
 “ soever they happen to fall into *Contact*; and

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“ they not only retard the inordinate Motion,
 “ but give such a Weight and Consistence to the
 “ Juices, as fits them for Nourishment : And Me-
 “ dicines of this Tribe are therefore of great Use
 “ in Hecticks, where the swift Motion of a thin
 “ sharp Blood wears away the Substance of the
 “ Body, instead of nourishing it : And whatso-
 “ ever answers this End, must be both endued
 “ with a Disposition to enter into, and mix with
 “ the most subtile of the animal Fluids, and so
 “ fall into, and adhere with such Interstices of
 “ the Solids, as have been worn away by Action,
 “ and stand in need of Recruit. *Quincy.*

By Sanguification we understand the Assimula-
 tion of the Chyle into Blood, and which is perfect,
 when the whole circulating Mass is *sated* or *replete*
 with an high florid Colour, and in the Porringer
 separates the *Crassamentum* from the *Serum*, with-
 out any white *chyleous* Matter floating on it; but
 whether the Liver or Heart are the immediate
Laboratories of Sanguification, is not our Business
 to enquire *here*, when many ingenious Men *satis-*
factory Demonstration *either Way*; and their Tri-
 umphs have lasted no longer than 'till Men of
 contrary Sentiments, and equal Learning, have
 enter'd the Lists with them, and, with as much
seeming Reason as they, proved *the quite contrary*.

No Part of the *Chyle* is or can be admitted into
 the *Lacteals*, but the most fine, *agile*, and thin
only, which after it has passed the Glands of the
Mesentery and *Pancreas*, and mixed with a little
Bile, it is at last impregnated with the finer Par-
 ticles of the Air in the Lungs, to bring it to Per-
 fection.

Of the Glands, and Animal Secretion.

A *Nimal Secretion* is defined to be that Separation of Juices one from another, which the Glands perform by the Laws of Circulation of the Fluid thro' proper Ducts in an *animal Machine*.

Glands are Circumvolutions or Branches of small Arteries, whose utmost Extremities become the *excretory Ducts* of the Glands. They are either *conglobate* or *conglomerate*. The *First* are they which are *undivided*, having one Substance and Composition, and have an even and smooth Surface; of *this Sort* are the Glands of the Brain, the labial Glands, and *Testes*.

The *Second* are composed of several little Bodies, or *conglobate Glands*, under one Membrane, such as the *Pancreas*, salival, and lachrimal Glands, &c. Sometimes all their excretory Ducts unite, and make one common Tube, thro' which all the Liquor of them runs, as the *Pancreas* and *Carotides* do. Sometimes the Ducts unite, and form several Pipes, which only communicate with one another by cross Channels, as the Breasts: Others have several *Tubes*, without any Communication with each other, as the *Prostata*, and *Glandule Lachrimales*: And a *fourth Sort* is, when each little Gland has its own excretory Duct, by which it sends its Liquor to a common *Pelvis*, or Basin, as the Kidneys.

Now, as the several Humours in the Body are separated by the Glands from the Blood; *that* must be either composed of so many Humours as are secerned from it, or else they must contain a certain Number of Principles, which, when mixed together, form the Blood, and which, when

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combined, form the different Humours which the Glands separate from it.

The Principles of all natural Bodies, are said not to exceed *five*; and if we suppose but five in the Blood, their Combinations *alone* (without different Modifications) will afford near as many different Humours as are separated from it; and it is certain, that Urine, Sweat, Milk, Tears, and Spittle, are compound Liquors, and that in each of them are Parts common to all of them; *and so it may be of others*: And as the several Humours are formed by various Combinations of Particles which compose the Blood, and as each Humour is secreted by Glands placed at the most proper Parts of the Body, the Particles of the Blood must fall into such Combinations as are fit to form those several *Fluids*, of whatever Denomination they are; otherwise the Glands could not separate them from the Blood: And where the Particles of the Blood are most dissolved, *there* are placed *such* Glands as separate *such* Humours, as consist of Particles that most *easily* combine. And at the greatest Distance from these, are situated the Glands which separate those Fluids, consisting of Particles which most slowly associate and unite: So by the Tenuity of the Liquor in the *Pericardium*, and of that which passes thro' the Kidneys, the Particles of the Blood seem to be most dissolved *in* and *about* the Heart; the Cause of which is the Force of the Air in Respiration, breaking and dissociating the Globules of the Blood; whilst the *Bile* and *Semen* being composed of Particles which associate and unite but slowly; and it being necessary that they should be *percolated*, where the Liver and *Testes* are placed, Nature has particularly contrived to give the component Particles of those Humours a longer Time to combine than they could have had, being

ing so near the Heart; a particular Account of both which may be seen explained, where we have treated of those two Fluids in this Work.

Now, how those Combinations are made of the Particles that compose the Fluids, Men of Learning and Speculation tell us, is from an attractive Power in the Parts of Matter, which, tho' equally diffused thro' the whole Mass, yet, according to the different Densities and Figures of Particles, some are sooner united than others, and so associate themselves, in order to form some particular Fluid.

The *Matter* of the Fluids being briefly accounted for, let us enquire how *different Glands* come to separate from the Blood *different Liquors*, and not admit one Fluid to pass thro' them as well as another; (and this by every Gland in common, one as well as another) for if they did *so*, there could be no such Thing as a Separation of any of them, or, if separated, they would again mix, and be confused: Wherefore, that it might not be so, but that the Fluids necessary to the Well-being and Continuance of the human Fabrick, should be only secerned from the Blood, and from one another, *and kept so*, it was necessary, that the different Glands should have Orifices of a Configuration, or Structure of Parts, exactly similar (or correspondent) to the Particles to be *secreted* from the Blood, which, when so separated, compose such particular Fluids that Nature has design'd them for the Composition of.

But I know that a very worthy and ingenious Gentleman of the Faculty, seems to explode this Theory, and says, (1.) That all the Vessels in the Body are either *conical* or *cylindrical*, and consequently there is no Difference in the Figure of their Orifices. (2.) That Liquors are susceptible of all Figures. (3.) That Bodies of any Figure, and a
lesser

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lesser Diameter than that of the Gland, will pass thro' that Gland; And, (4.) That a Body of a similar Figure, and equal Diameter with the Orifice of the Glands, may be presented innumerable Ways, and not be able to pass thro', whilst there is only one Way it can pass. But suppose, (1.) That the Vessels do all bear a *conical* or *cylindrical* Figure; this is no good Reason why there should be no Difference in the Figure or Make of the Orifices of their Glands; for if there were not, then one Fluid would be secreted thro' them as well as another, and both Urine and *Lympha* would be always either bloody or *bilious*. And, (2.) If we allow that Liquors are susceptible of all Figures, it must be in a *limited Sense*; for, in a natural and healthy State, they keep their proper Figures, in order to a regular Secretion; and when, by any Accident, the Blood is *fused*, and the Texture of its *Globuli* broke, it so alters its Figure (it is true). as to be capable to come all away by the common Strainer of the Kidneys, and so produce a *Diabetes*; yet, let it but preserve its true Texture, and then none but the *serous* Part (and none of the *Craffamentum*) will ever come that Way; the florid or grumous Part having not Figures (*naturally*) fit for such Percolation, 'till its *Craffis* is broke, and its Globules disunited, and their Fibres tore in Pieces. (3.) If Bodies of any Figure, and of lesser Diameters than the Orifices of the Glands, will pass thro' them, then all Fluids would indifferently be secreted by any secretory Gland they met with, (if of lesser Diameters) and then all Fluids of small Diameters could not fail of passing thro' Glands of large Orifices, and so cause a Confusion in the Animal OEconomy. And, (4.) If Bodies of the same Figure and Magnitude of the Orifices of the Glands, should not be able to pass them,

them, if presented different Ways, we ought to be informed *why*, or rather we should be told *what* those Figures are that they assume, when they are put under such an Incapacity. If he had, indeed, affirmed, that Bodies of the *same Magnitude* could not pass the Orifices of Glands of *different Figures*, it had been just : But that they will not pass the Glands appointed for their Secretion, if presented in *different Ways*, is what *we think* wants both Proof and Explication.

But to pay all due Respect to the great Abilities of this learned Gentleman, whom I really honour, and to whom the Commonwealth of Physick is greatly obliged, I shall lay aside his Way of Demonstration by *Diagrams*, and give the Reader his Opinion, in his own Words, to demonstrate how *different Glands* come to separate different Parts of the Blood, and leave the Reader to judge as his Reason shall incline him.

“ It is next to be known (says he) *how* such a
 “ Structure can separate from the Blood *only* some
 “ Parts of it, and how *different Glands* may separate
 “ *different Parts* of the Blood. If *such a Fluid*
 “ is to be drawn off, as consists of the *smallest Particles*
 “ of the Blood, let that Orifice of the Gland,
 “ which is inserted into the Artery (of which it is
 “ a Branch) be *so small*, as to admit only the *smallest*
 “ *Particles* of the Blood, *then these, and these only*, will
 “ enter *this Gland* ; and the Fluid which passes out
 “ at the other Extremity of the *Tube*, or the excretory
 “ Duct, *must* be such as is required. If the
 “ *Particles* of the Blood, which are of the *next Size*,
 “ or *Magnitude*, are required to be separated, let
 “ the Orifice of the Gland be *so big*, as to receive
 “ those *second Particles*, but *small enough* to exclude
 “ all *bigger Particles* ; then these *second Particles*,
 “ together with the *first*, or *smallest*, will enter
 “ the Glands : But, because the Liquor to be se-
 “ *parated.*

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“ *cerned*, is to consist *only* of the second Sort of
 “ Particles, (that is, the second Sort of Particles
 “ *only*, are to flow out at the Extreimity of the
 “ *Tube*, which is the excretory Duct) therefore
 “ we are to suppose, that *this* Gland, (which is
 “ only a Branch of an Artery, and differs no-
 “ thing from a common Artery, but in the Nar-
 “ rowness of its Chanel) has Branches, which are
 “ big enough to receive the *smallest* Particles *only*,
 “ and carry them off into the Veins; so that, as
 “ *both* Sorts of Particles move together along the
 “ Gland, the *smallest* Particles will pass off thro’
 “ its Branches, and a Fluid, consisting chiefly of
 “ the *second* Sort of Particles, will arrive at the
 “ excretory Duct. Thus, the Number of Bran-
 “ ches *may be* so great, as to draw off most of the
 “ *smallest* Particles. *before* the *second* Sort of Par-
 “ ticles arrive in the *excretory Duct*. So the Li-
 “ quor to be *secerned*, *may* consist of *both* these
 “ Sorts of Particles mixed together, in any *Propor-*
 “ *tion*, according to the Number of Branches. If
 “ a Fluid, consisting of a *third* Sort of Particles,
 “ *larger* than any of the former, is to be *secerned*,
 “ the Orifice of the Gland must be *just big enough*
 “ to admit *such* Particles, and *none bigger*; and
 “ the Branches of the Gland *must be small enough*
 “ to exclude the *biggest* Particles, and *big enough* to
 “ receive the *lesser*; and according as the Num-
 “ ber of Branches is either *greater* or *smaller*, the
 “ Fluid which runs out at the excretory Ducts,
 “ will consist either of the *largest* Particles, or of
 “ *all together*, mixed in any Proportion: And *thus*.
 “ we may understand *how* a Liquor, *thicker* than
 “ the Blood, may be strained off from the Blood,
 “ if the Orifice of the Gland be *so big* as to *ad-*
 “ *mit* Particles of *any* Size; and the Branches *so*
 “ numerous, as to draw off the *thinner* Parts, *be-*
 “ *fore* the *thicker* arrive at the excretory Duct.

Now

Now we shall only say, that if there was as much real Demonstration as witty Contrivance in *this Theory*, we should very readily subscribe to it; but it is clogg'd with *so many* Suppositions, *not proved*; *so many ifs, may be's, &c.* that we shall take Leave to say, *we cannot give in to it.* Nor shall we enter into Arguments against it, but believe, what we have said *above* will give Satisfaction to every unprejudiced Reader concerning the Point in Question.

Of the Semen Virile, Ovaria, and of Generation.

IN the natural *Mechanism* of every Specifick Generation, there is a particular Tendency in all the Parts that compose that *Machine*, to propagate its Like; and Man, who is the most perfect of all Animal Beings, and who came into the World, furnish'd with all Necessaries fit for Propagation of a Race of Creatures like himself, must needs have the whole Form and Figure of his own Species within himself, and existent in his Nature; and must therefore have proper Parts formed for the Production of such *latent Embryoes*, as afterwards receive their Growth from proper *Matrixes*, from whence they are nourished by the same Kind of *univocal* Heat and Aliment, as at first they were formed. But tho' we design all possible Brevity, so far as is consistent with Truth, and the Design of our Undertaking; yet we would not omit anything, that may give the Reader either Pleasure or Profit; that is, our Arguments shall be plain and instructive: And in order to unravel the Methods and Springs of Generation, and thro' the whole to give the Reader

Reader a clear *Idea* of what he is endeavouring to comprehend; we shall proceed Step by Step, and, as Order requires, begin with the *Semen Virile*, without which, no Generation-Work can be effected. To proceed then, we are to take Notice, that the Spermatick Arteries, which carry the Blood to the Testicles, are (contrary to the Texture of the other Arteries) *smallest* where they spring from the Trunk of the *Aorta*, and immediately enlarge to a considerable Magnitude; the Intent of Nature *thereby* being to check the Celerity of the Blood, that the Seed may be the better elaborated.

The Orifices of the Spermatick Arteries being so very *minute*, that they admit of no Mensuration, as others do, and yet, as soon as departed from the *Aorta*, they dilate to the Magnitude of one of the *Lumbals*, which is $434 : 2$. now supposing their Orifices to be $17 : 3$. the Blood will have a Motion 25 Times slower, where the Artery dilates, than at its Orifice.

If the Blood had been carry'd to the Testicles, as it is to all other Parts of the Body, by small Arteries from the nearest Trunk, they had received their Arteries from the *Iliacks*, and they had not ran far before they had come to their Journey's End: But, on the contrary, there arise two small Arteries from the *Aorta*, a little below the Emulgents, and march more than a Foot before they reach the Testicles. Now we must consider, that the *Celerity* of the Blood in the Spermatick Artery, is *at least* 25 Times slower than it is at the Orifice in the *Aorta*, and that the Celerity of the Blood in the *Iliacks*. is but little less than in the *Aorta*, where the Spermaticks have their Rise; and the Blood of Course must move 25 Times slower to the Testicles, than if it had gone in the common Way from the *Iliacks*: And
because

because the Length it runs thus slowly, is no less than six Times more than if it had gone by the *Iliacs*, it must be 150 Times longer in going to the Testicles, than if it had gone in the ordinary Road; by which the Blood's Motion is lessened, and sufficient Time given for the *Coalescence* and Union of the Particles, which are to compose the *Semen*, before they reach the Testicles; and after the Secretion of the Seed, the Veins carry back the Blood to the *Vena Cava*, and the Seed is farther perfected in the *Epididymes*, and in *Congressu* is carry'd into the *Urethra* by the *Vasa Deferentia*.

The Substance of the Testicles, where the Seed is elaborated, is the Foldings of many small and soft seminary Pipes, (which, could they be drawn out at Length, would be 20 or 30 Ells long) being divided from one another by thin membranous Productions, which unite at the *Axes* of the Testicle, and make a Cover to several small *Tubes*, which at the End of the Testicle make one *Canal*, which, by divers Turnings and Windings, on the upper Part of the Testicle, forms the *Epididymis*. The same Canal ascending, and continuing from the Extremities of the *Epididymis*, form the *Vasa deferentia*, one from each *Epididymis*, of near the Bigness of a Goose Quill, which march over the Ureters, between the Bladder and *Rectum*, and become larger, as they approach the *Vesiculæ Seminales*, which open into them, and come close together; and then growing less and less, they pass the *Prostata*, and open into the *Urethra*, a little below the Neck of the Bladder, where each Orifice has a spongy Border named *Caput Gallinaginis*; and this is what prevents the involuntary Emission of the Seed.

The *Vesiculæ Seminales* are situated between the Bladder and strait Gut, one on each Side, tyed both to the Bladder and Gut, by a thin Membrane, which

which in *Coition* contracts, and presseth the *Vesicula*. They are the Breadth of two Fingers long, and their broadest Part is not above an Inch, and they narrow by little and little to their End next to the *Prostata*. They have two Cavities divided into Cells, and have two Orifices in their Extremities, which open into the two *Vasa deferentia*, from whence they receive the Seed, separated by the Testicles, to be kept as in a Store-house 'till the venereal Congress.

The *Prostata*, or *Corpus Glandulosum*, is about the Bigness of a Walnut, placed at the Neck of the Bladder; the *Vasa deferentia* pass thro' its Substance, which is glandulous and vesicular. The Glands separate a limpid muciliginous Humour, which, 'till *Coition*, lodges in those Bladders, and then it is carry'd into the Beginning of the *Urethra* by about a dozen excretory Ducts, which appear about the Orifices of the *Vasa deferentia*.

And thus far of the Parts ministring to Generation in Men: We shall next, as Order requires, give some short Account of those in Women; and then we shall have our Way clear for what we design to say relating to Conception, and the Nutrition of a *Fetus* in the Womb. And in order to go on regularly, we shall begin with the *Vagina Uteri*: It extends from the *Pudendum* to the internal Mouth of the *Uterus*: Its Dimensions are uncertain, according to various Circumstances, it differing in Virgins, from those that have had Children; and from one another, in such as have borne them, according as different Accidents have occur'd, &c.

The *Matrix* is placed in the lower Part of the *Hypogastrium*, between the Bladder and *Intestinum Rectum*. Its Figure is like a Pear, three Fingers Breadth long, two broad, and near as much in Thickness; and in Virgins, its Cavity is no bigger than

than a large Almond. In the Time of *Gestation*, the Bottom of the Womb thickens, so that in the last Months it is at least an Inch thick, where the *Placenta* adheres to it. It is fastened by two broad Ligaments, called *Ligamenta lata*, and by two round ones, named *Ligamenta rotunda*: The *two first* are only a Production or Continuation of the *Peritoneum*, from the Sides of the *Matrix*. The *Ovaria* are fixed to one End of them, and the *Tubæ Fallopianæ* run along the other. The *two last* spring from the Sides and Fore-part of the Bottom of the Womb, and pass thro' the Rings of the transverse and oblique Muscles of the *Abdomen*, and on the *Os Pubis* expand like the Foot of a Goose, and are *in part* inserted there, and *in part* joined to the *Musculus membranofus*, on the Inside of the Thigh, towards its upper Part; and from hence it is that pregnant Women feel a Pain *there*.

The *Tubæ Fallopianæ* are about 4 or 5 Fingers Breadth long, and have the same Vessels as the *Ovaria*: They are situated on the right and left Sides of the Womb, and rise from its Bottom by a narrow Beginning, but towards their Extremities dilate in the Form of a Trumpet, where again they contract into a smaller Orifice, from whose Circumference they dilate each into a broad Membrane, jagged in its Edges, and therefore called *Mersus Diaboli*. Where these Tubes open into the Womb, their Cavity is hardly large enough to admit of a Hog's Bristle; but in the widest Part, they will receive the End of one's little Finger. They are about four or five Fingers Breadth long.

The *Ovaria*, or Testicles, are tyed about two Fingers distance from the Bottom of the Womb, by the *Ligamenta lata*: They are about half as big as in Men, a little flat on their Surface, where the spermatick Vessels enter; they are composed of Fibres and Membranes, that leave little *Inter-*

stices

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ffices between them, in which are several small Vesicles full of Water, and round, and these Vesicles are called Eggs; and which being boiled, their Liquor hardens, and is like the White of a Bird's Egg. Their Number is uncertain; but in common Computation, there are reckoned 20 in each Testicle, and some are less than others. The Liquor contained in them, were supposed by *Hippocrates*, and *Galen*, and their Followers, to be the female *Semen*, stored up there, and that they supply'd the Place of the *Vesiculæ Seminales* in Men.

But down from Dr. *Harvey*, most Anatomists have deny'd all Seed to Women; of which *Harvey* himself thus writes: "Some Women emit no
" such Humour as is called Seed, and yet Con-
" ception is not thereby necessarily frustrated; for
" I have known several Women that have been
" fruitful enough, without such Emission; yea
" some, that after they began to emit, &c. grew
" less fruitful than before, &c. And then adds,
Mirror maximè eos, qui emissionem hanc ad Generationem necessariam putant, non animadvertisse humorem illam foras ejici, & circa Clitoridem Vulvaque Orificium, & plurimum profundè. rarò intra Vulvam, nunquam verò intra Uterum, ut cum maris Spermate misceatur; esseque consistentia seorsum sive ichorosum, ad modum Urinæ, non autem genituræ instar, lentum atque unctuosum; ut tactu facile innotescit, quorsum autem foras ejiciatur, cujus usus necessariò intus requiritur? Debitne Humor ille, seu Utero valedicturus, ad limen Vulvæ amandari; ut majore cum gratia, ab Utero retraheretur denuo? So that both from the Place of its Emission, and from its Consistence, he infers, that the Humour emitted cannot be *Semen*, nor proceed from the *Vesiculæ* in the *Ovaria*: (1.) Because it is emitted in greater Quantity than it can be supply'd from the *Vesiculæ*. (2.) Because the *Vesiculæ* are destitute of any such Passage to
let

let the Liquor out which they contain: For if they are pressed never so hard, nothing will pass out from them, unless they are burst. So that we must suppose, that those *Vesiculae* do not contain anything of Seed, but serve however to the same Purpose as Seed in Generation, altho' they are no more in Reality than Eggs, analogous to those of Fowl, and other oviparous Creatures; and that the female *Testes* are not really *such*, altho' so called, nor have any such Office as those of Men; but are *only* an *Ovarium*, where these *Ova* receive Nutrition from the sanguinary Vessels dispersed thro' them, and from whence, as they are *fecundated* by the male *Semen*, one or more of them separate, and are conveyed into the Womb by the Fallopian Tubes aforementioned, where it receives proper Nourishment and Growth, as shall presently be evinced.

This *Hypothesis* was universally *almost* receiv'd, till the *Microscopical* Observations of *Lewenboeck* grafted something *on*, and took something *from* it, he being the first Discoverer of the *Animalcules* in the male *Sperm*, which is this, *viz.* That in the *Semen* of all male Animals, there are incredible Numbers of *Animalcula*, or little Animals swimming about, (invisible to the naked Eye, but discoverable by Glasses) like so many *Tadpoles*, whose Motion is very languid in the *Semen* of pocky Subjects, and who recover their former Vigour as the Pox goes off again: They are said to be so very small, (but I dare not vouch for the Truth of it) that 3.000.000.000 are not equivalent to one Grain of Sand, which is but $\frac{1}{1000}$ of an Inch in Diameter; and where the *male Seed* is destitute of these *Animalcula*, the Female is unfruitful, which otherwise would not be *so*, they having a principal Share in Generation, and without which there could be no Conception: This we readily acquiesce

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in; but dissent in some Things, both from *Lewenboeck* and *Harvey*, and shall give our Reasons *why*.

And (1.) *Harvey* and his Followers say, that the Eggs are the material and formal Rudiments of the Body of the future Man, which the Seed of the Male did only impregnate and vivify: But that the *Ova*, before Impregnation, did formally and materially contain the Body of the Man, altho' it could not germinate and increase, 'till render'd prolifick by the Male Seed.

And (2.) *Lewenboeck's* Theory of Generation teaches, that when the *Animalcula* contained in the Male Seed, gets Entrance into an *Ovum* (the Way which it does so, shall be enquired into by and by) and it falls off from the *Ovaria*, thro' one of the Fallopian Tubes, into the *Uterus*, the *Animalcula*, and not the *Ovum*, is the entire *Fœtus*, and the *Ovum* is only a Kind of Matrix, and affords only a *Pabulum* to the *Embryo*: But be it which you please, we think that both the *Semen* and *Ova* are equally concerned, and make together an entire *Embryo*; which when in the *Uterus*, either the Humour distilling thro' the Vessels of the Womb penetrate its Coats, which tumifies and dilates it, or else the Ramifications of the Arteries and Veins, which tie the *Ovum* to the *Ovaria*, break, and fasten with the Vessels of the Womb, and then the *Placenta* appears like a Cloud on the external Coat of the *Ovum*, and the Spine of the *Embryo* is visible; and soon after, the *Cerebrum* and *Cerebellum* appear like two Bladders, and the Eyes stand prominent, or jetting out of the Head; and now is the Time that the Beating of the Heart is perceived, the Extreame Parts discovering themselves last of all.

Now, as to both these *Hypotheses*, Objections may be raised equally against them: For if the Doctrine of the *Ova* be entirely true, viz. that the

Ovum

Ovum is the material Cause of the Animal, and which the Male Seed only impregnates; then the *Fætus* would follow the *Species* of the Dam, let the Sire be what it will; *because the Animal is determin'd before hand*, and the Male contributes *nothing* to it, but the Means of Life and Vegetation; and the *Kind* would be as certain as in Plants, where the Soil that the Seed is thrown into, (let it be what it will) does not alter the *Species* of the Plant. And, *according to this*, the Conjunction of an Ass and a Mare could never produce a *Mule*, but an *Horse*; nor would a Child be ever like its Father, much less have any Resemblance to his remote Kindred; (and which its Mother never saw, and so its Likeness to them could not proceed from her Imagination) yet we know this often happens, *even so* as to extend to private Marks, Shape, Face, Voice, and what not?

And if the Theory of the *Animalcula* was altogether true, *viz.* That the *Animalcula* is the entire *Fætus*, and the *Ovum* only a kind of Bed, to hatch it in, or a sort of Soil, proper for its Vegetation and Increase; then the Conjunction of an Ass and a Mare would not produce a *Mule*, but an *Ass*: For if either of these *Hypotheses* were true, their Young must be either *all Asses*, or *all Horses*, and there could be no such Thing as a *Mule*; and *so* it would be in all other mixt Intercourses. But it is very evident, by the Likeness, or Resemblance, which the Child (for Example) bears to both Father and Mother, and often to both their Kindred, that to the Determination of the *Species*, both Father and Mother concur, and sometimes one prevails, and sometimes another, which could not be, if either of the foregoing *Hypotheses* were absolutely true. But both the *Semen* and *Ova*, (notwithstanding all that can be said) we believe to be a *Causa sine qua non*, in every Generation. And there we shall leave them, and only observe, that

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tho' the *Ova* have assuredly their Existence in the *Ovaria*, beyond all Dispute; yet the Existence of the *formed Animal* in the *Ovum*, has never yet (as we know of) been proved, but supposed only, from the Analogy it is imagined to bear to the Seed of Plants; in some of which it is pretended, that by good Microscopes, the Figure of the Plant has been discover'd; and we take leave farther to add, that if either *Harvey* or *Lewenboeck* were absolutely in the Right, it must cause very great Doubts to arise in every Christian's Breast, and leave him in a very great *Dilemma*, as to the Truth of what the Bible contains: For if *Harvey's Hypothesis* be certain, how can our Saviour, in a proper Sense, be called the Seed of *Abraham* and *David*? Or if *Lewenboeck's* were so, How can he be called the Seed of the Woman? Both which we know he most certainly was. According to the first, *Ephraim* and *Manasseh* were not of the Line of *Jacob*; nor could they have been of the Number of the Patriarchs, they owing their Being wholly to their Mother, *Potiphar's* Daughter; and according to the latter, our blessed Saviour could take no Part of the Virgin *Mary*, his Mother, nor by consequence be of our Nature, he having no humane Father to beget him; which is a Thought so vile and blasphemous, that I hope my Soul will for ever abhor. But tho' it should be the Part of him that denies a Position, not only to overthrow it, but establish a better; yet, since (I hope) what I have objected is sufficient to justify my Dissent from either of the above-mention'd Theories, so, if I could not account for the *Modus* of Generation in some more rational and probable Way, yet, since neither of the others can be true, I might be justify'd, if I should say as *David*, not only fearfully and wonderfully am I made, Ps. 139. 14. but fearfully and wonderfully was I begotten also, without being accountable for the
Manner

Manner how ; there being some Things *above* our Reason, tho' not *contrary* to it. And let me beg of those Readers, that have more flashy Wit, than divine Knowledge, to forbear their Smiles, 'till they have seriously thought over what I here have advanc'd ; and then, if they cannot give in to my Way of Reasoning, yet to bear with me as a Man that am subject to Failings and Mistakes, which I shall be ready to be sorry for, and retract, if I am friendly and calmly informed of them.

But to finish my Digression, I shall proceed to the *Modus* of Conception, according to the above-mention'd Theories of it, and then make my Objections, at the same Time, submitting to better Judgments. And first, *Harvey* and his Followers say, that the *Semen* being injected into the *Vagina*, the *Uterus* receives it, and sends up the Seminal *Effluvia*, thro' the *Tubæ Fallopianæ*, to the *Ovaria*, to bedew, or fecundate one or more of the *Ova* ; which being thus impregnated with a Seminal *Gass*, ripens, and falls off from the rest, *directly* into one of the said Tubes, and so into the Womb, in order to Nutrition, &c. But by *Lewenboeck's Hypothesis*, the Seminal *Animalcula* pass the *Uterus* and Tubes, and one or more of the Eggs, being *predispos'd*, receive the *Animalcule* (as it were) into its Bosom, and embraces and adheres to it, and at last gets loose from the rest, and falls down with it into the *Fallopian Tube*, and so into the Womb, like the other ; so that tho' *the one* attributes the Formation of the *Fetus* to the *Ovum*, by vertue of the Seminal *Effluvia*, and *the other* to the *Animalcula* receiv'd into the *Ovum* ; yet they *both* agree, that it must be by passing up the Tubes to the *Ovaria*, which I crave Leave to object against. And (1.) This is such an improbable Method, as Nature never takes in any of her other Operations. (2.) The Ends of the Fallopian Tubes are so very

small, where they open into the Womb, that they will hardly receive a Hog's Bristle, and which seems as if contriv'd on purpose that nothing should pass that Way, but are *large* at the upper end, because they might be capable to receive the *Ova*, as they drop from the *Ovaria*. (3.) The Ends of these Tubes are not only so *very small*, but the Tubes themselves are 4 or 5 Fingers Breadth long, and their large Ends at a considerable Distance from the *Ovaria*; and yet for the Egg to be fecundated *this Way*, I must confess, I am not satisfy'd how it can be.

That the Females may have no proper *Semen*, but that the *Ova* supply its Place in Generation, I will allow: That the Fecundation of a *Fœtus* proceeds from the spiritous Parts of the *Semen Virile*, or *Animalcula*, adhering to, or being closely embraced by the *Ova*, I will not deny: And when the *Ovum* is so impregnated, that it falls from the *Ovaria* into one of the Fallopian Tubes, and so into the *Uterus*, I verily believe: *But then*, I conceive, that in *Congressu*, the Male *Semen*, instead of sending *Effluvia*, or *Animalcula*, thro' the *Tubæ Fallopianæ*, to the *Ovaria*, is rather imbib'd by the Veins of the *Vagina* and *Matrix*, where circulating, it ferments with the Mass of Blood, and enters *into* and impregnates the *Ovum*, by the small Branches of Arteries, which are upon its Membranes, if predisposed to receive it; *and then* the *Ovum* falls thro' the *Tubæ Fallopianæ* into the Womb, &c.

The *Ovum* being fallen into the Womb, quickly swells and grows bigger; and there is (as we may say) an Egg within an Egg, by Means of the Membranes that cloath it, which now imbibe the Moisture that is sent plentifully to the Womb, &c.

Before the Parts of a Child are formed in the Womb, it is call'd an *Embryo*, but afterwards a *Fœtus*, whose Fluids were in Being, and its Parts
existed

existed before Generation: When it is formed, it is near of an Oval Figure, its Head hanging down, with its Chin on its Breast, its Back round, and its Knees embrac'd by its Arms, which seem to draw them up to its Belly; its Heels are up to its Buttocks, its Head is upwards, and its Face towards the Belly of its Mother, till about the ninth Month, when its Head falls downwards, its Feet go up, and its Face (if it comes right for the Birth) is towards the Back of its Mother.

On the Out-side of the outward Membrane of the *Embryo*, call'd *Chorion*, about the 8th or 9th Week after Conception, appears a woolly Substance, and a little while after a red, carnous, and soft Substance grows, but unequally, and with little Knots, which *thereby* quickly adheres to the Womb, and is very visible about the 12th or 13th Week; and this is call'd the *Placenta Uterina*, or Womb Liver.

9. Until now the *Fetus* is wholly nourish'd by the *Apposition* of the ChrySTALLINE or albuginous Liquor, in which it swims loose in the *Amnios*, or inner Membrane in which it is encompass'd, having, *as yet*, no *Vasa umbilicalia* formed to receive any Thing from the *Placenta*: But as the *Fetus* grows bigger, and wants more Nourishment, the Extremities of those Vessels begin, *gradatim*, to grow out of the Navel, extending towards the *Placenta*, in which they take Root, as the fibrous Roots of Trees do in the Earth, and even in Walls and Rocks, and out of it (as Plants do out of the Earth) draw a more firm, nutritive Juice, and carry it to the *Fetus*.

As in a Nut that has two Kernels, they are however both included in the same Shell, and yet each of them invested with its proper Membrane; so when a Female goes with Twins, there is but one *Chorion*, or outward Membrane to inclose them

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them both; but they have each (be they two or more) a particular *Amnios*; and altho' both *Chorion* and *Amnios* encompass the *Fetus*, yet they are not united in any Part, only where the Umbilical Vessels pass thro' them both, into the *Placenta*.

The Liquor that the *Chorion* imbibes, before the Umbilical Vessels are framed, Dr. Gibson takes to be the nutritious Juice that owzes out of the Capillary Orifices of the *Hypogastrick* and *Spermatick* Arteries, and is of the same Nature with that which is afterwards separated in the *Placenta*, and carry'd to the *Fetus* by the Umbilical Vein, and with that also which abounds in the *Amnios* even until the Birth; for the vegetative Virtue is only in the *Ovium* it self, and the Increase that the first Lineaments of the *Embryo* receive, is only by *Apposition* of this nutritious albuginous Juice: But *this Membrane*, by that time the Umbilical Vessels and *Placenta* are formed, is grown so *dense* and compact, that it is incapable of imbibing more; but that which at this Time is in it, does in a small time *transfude* into the *Amnios*, and so it self becomes empty, and gives Way to the Increase of the *Allantoides*, (which thence forward begins to appear) whose Liquor augments daily, as the *Fetus* grows near to the Birth; but this he says is only his Opinion, which he submits to the Censure of the Learned.

Before the *Ovum* is impregnated, the *Amnios* contains a limpid Liquor, which, after Impregnation, is that out of which the *Embryo* is formed; in it resides both the *plastick Vertue* and the *Matter also*, out of which the first Lineaments of the *Embryo* are drawn; but because the Quantity of Liquor in this Membrane is so very small, there *transfudes* thro' it Part of the nutritious Humour that is contain'd in the *Chorion*, which it had imbibed out of the *Uterus*; and by the Accession of
this

this Humour to the (as yet) undiscernable Rudiments of the *Embrio*, it receives its daily Increase, till the *Placenta* and *Vasa Umbilicalia* are formed; and then this Liquor, being separated from the Mothers Arteries by the *Placenta*, and imbibed by the Umbilical Vein of the *Fetus*, it passes directly to its Heart; from whence being driven a great Part of it down the *Aorta*, it is sent forth again by the Umbilical Arteries, whose Capillaries being plentifully dispers'd thro' the *Amnios* out of them, it issues into its Cavity, just as more viscid Juices (in taking a Purge) owze out of the small Mouths of the Arteries that open into the Intestines.

As soon as the *Fetus* begins to be nourished by the Umbilical Vessels, and that the *Urachus* is permeable, a third Membrane, investing it, begins to shew itself, call'd *Allantoides*; yet altho' there is no Appearance of it till after the *Vasa Umbilicalia* and *Placenta* are formed, and the albuginous Liquor before-mention'd ceases to be imbibed by the *Chorion*, out of the *Uterus*, yet we must suppose that this Membrane, as well as the other two, was originally in the *Ovum* as well as they. It has the same Figure as the *Chorion* and *Amnios*, between whom it is placed in their whole Circumference.

The Liquor it contains is the Urine of the *Fetus*, brought into it by the *Urachus* from the Bladder, and which is more and more, daily fill'd until the Birth; for it is of Necessity, that as soon as the *Fetus* is compleatly formed, its Kidneys must perform their Office of Filtration, by separating the *Serum* from the *Blood*, otherwise its Bladder would burst, or the *Fetus* be Dropsical: We say it is separated in the Kidneys, and from thence slides down into the Bladder, where it is found in plenty in the fifth or sixth Month. Now it

it does not flow out of the Bladder again by its Neck, the Sphincter being then too much contracted, and narrow; or if it did, it would mix with that nutritious Juice, in which the *Fetus* swims in the *Amnios*, and by which it is partly nourish'd, by taking it in at its Mouth, and so would render it unfit for Nutrition: Therefore Providence has wisely order'd it so, that it should not pass that Way, but by the *Urachus*, which is inserted into the Bottom of the Bladder; which, whilst the *Fetus* is in the Womb, is always *pervious*, and carries the Urine into the *Allantoides*; that is, between the *Chorion* and *Amnios*, where it is preserv'd, as in a Store-house, till the Birth, and then the *Urachus* becomes solid like a Ligament; which, notwithstanding, in *some* adult Persons that have had their Urine wholly *stopped* by the common Road of the *Penis*, the Passage in this Vessel has been *unstopped*, and they have discharged their Urine by the Navel.

How the Fætus is nourished in the Womb.

Many have been the Disputes with *what*, and *how* it is nourish'd, some affirming that it is by Blood *only*, receiv'd by the Umbilical Vein; others by Chile *only*, taken in by the Mouth; but according to the different Degrees of Perfection, that an *Ovum* passes from a Conception to a *Fetus* ready for the Birth, it is nourish'd different Ways.

I. As soon as the Egg is impregnated, and descended into the Womb, it imbibes thro' its outward Membrane some of that albuginous Liquor already mention'd, which at that Time bedews, in great plenty, the internal Parts of the *Uterus*; so that as soon as the first Lineaments of an *Embryo* begin to be drawn out of that Humour contain'd in the *Amnios*, they directly receive In-crease

crease by the *Apposition* of that Liquor, filter'd out of the *Chorion* thro' the *Amnios* into its Cavity, which Liquor is by Dr. *Harvey* call'd *Colliquamentum*.

2. When the *Embrio* begins to have its Parts a little more perfect, and the *Chorion* is become so dense as not to imbibe any more Liquor, the *Vasa Umbilicalis* begins to be formed, and extend to the lateral Parts of the *Amnios*, which they penetrate; and both the Vein and Arteries pass thro' the *Allantoides* and *Chorion*, and are implanted into the *Placenta*, that, at this Time, first gathering upon the *Chorion*, joyns it to the *Uterus*; and now the Hypogastrick and Spermatick Arteries, that till this time spewed out the *succus nutritius* into the Cavity of the *Uterus*, open by their Orifices into the *Placenta*, where they deposite the said Juice, which is absorbed by the Umbilical Vein, and by it convey'd to the Liver *first*, and *then* to the Heart of the *Fetus*, where the most spirituous Part is converted into Blood, and the more gross Part, descending by the *Aorta*, enters the Umbilical Arteries, and (by such of the Branches as run thro' the *Amnios*) is discharg'd into its Cavity.

3. The grosser nutritious Juice being deposited by the Umbilical Arteries in the *Amnios*, as soon as the Mouth, Gullet, Stomach, &c. of the *Fetus* are so formed, as that the *Fetus* can swallow, it sucks in some of that Juice, which descending into the Stomach and Intestines, is (as in adult Persons) receiv'd by the *Vena lactea*; and that it is so is evident from hence, 1. Because the Stomach of a *Fetus* is never found empty, but in it a milky Sort of Liquor; and such is found in the Mouth also. 2. There are *Feces* call'd *Meconium*, found in the Intestines, which it voids by Stool as soon as it is born; and these can be no other than the Excrements of some *Aliment*, taken in
by

45 Of the Semen Virile, Ovaria, and

by the Mouth. 3. The Stomach, if it had not at all been accustomed to the Function of Concoction whilst in the Womb, could not *immediately*, after the Birth, perform it. 4. The Infant, *as soon as born*, knows how to suck the Breast, which it could not be supposed to be so dexterous at, if it had taken nothing by Suction whilst in the Womb. 5. Because some Infants, as soon as born, vomit up a milky *Aliment*, before they have sucked any Breast at all, which they must have receiv'd into their Stomach in the Womb, or how came it there?

That the *Fetus* is nourish'd by the Mother's Blood, convey'd by the Umbilical Vein, altho' an ancient Opinion, cannot be true; not only from what has been just now said, but from an Argument taken from Dr. *Harvey*, concerning the *Cæsarian Birth*; for if the *Fetus* had its Life and Heat from its Mother's Blood, it must needs die as soon as she, or sooner; for at Death the subordinate Parts languish and grow cold before the principal, and therefore the Heart fails last of all; wherefore the Blood of the *Fetus* would first lose its Heat, and be unfit for its Office, if it were derived from its Mother's Womb, *because* her Womb is destitute of all vital Heat before her Heart.

Wherefore (by Way of Recapitulation) we conclude, that the *Fetus* is nourish'd three several Ways, yet (however) but by *one* Humour only, *viz.* by *Apposition* of it, whilst it is an imperfect *Embryo*, and has not the Umbilical Vessels form'd; but when these are perfected, it then receives the same nutritious Juice by the Umbilical Vein, the more thin and *spirituous Part* whereof it transmutes into Blood, and sends forth the more grosser by the Umbilical Artery into the *Amnios*, which the *Fetus* sucks in at its Mouth; and under-

going

going a new Concoction in its Stomach, is receiv'd out of the Intestines by the *Vena lactea*, as in adult Persons.

I confess (says Dr. Gibson) it is unexplicable to me how Blood should be made so soon; how should Blood be first bred in the *Fetus*, seeing it has Blood, before the Liver or Heart, or any other Part that conduce to Sanguification are in a Capacity to perform their Office? We must be content (where we cannot assign any mechanical Cause for this, or the like *Phanomenon*) to resolve it into the admirable and unintelligible Disposal of our wise Creator; but that Blood *may be*, and *is made* out of the *Colliquamentum*, without the Mixture of any from the Mother, is apparent from *Harvey's* Observations concerning the Order of the Generation of the Parts in a Chicken, (which receives nothing from the Hen, from first to last) "There appears (says he) at the very first a red leaping *Punctum* or Speck, a beating Bladder, and Fibres drawn from thence, containing Blood in them: And as much as one can discern by accurate Inspection, Blood is made before the leaping Speck is formed, and the same is endued with vital Heat before it is stirred by the Pulse; and as the Pulsation begins in the Blood, and from it, so at length (at the Point of Death) it Ends in it.— And because the beating Bladder, and the sanguinous Fibres, that are produced from it, appear first of all, I should think it consentaneous to Reason, that the Blood be before its Receptacles; namely, the *Content* before the *Container*, and that *this* is made for the Sake of *the other*. *De Generat. Animal. Exercit.* 51.

He confesses it to be a Paradox, that Blood should be made and moved, and endued with vital Spirits, before any sanguifying, or motive Organs

Organs are in Being; and that the Body should be nourished and encreased before the Organs appointed for Concoction (*i. e.* the Stomach and Bowels) are framed: But neither of these are greater Paradoxes than that there should be Sense and Motion in the *Fetus*, before the Brain is composed; and yet the *Fetus* moves, contracts, and stretches out itself, when there is nothing conspicuous for a Brain, but clear Water. Now if all these improbable Things do come to pass (as most certainly they do) in an Egg, that has nothing to set the vegetative Power, or vital Principle thereof, on work, except the Warmth of the Hen that sits upon it, why should we think it strange, that nutritious Juice, impregnated with the vital Spirits of the Arterial Blood, with which it circulated thro' the Mother's Heart, (perhaps more than once) should be turn'd into Blood in an human *Fetus*, (foster'd with such kindly Warmth in the Womb) tho' it neither receive any Humour, under the Form of Blood, from the Mother, nor have its self, as yet, any Organs of Sanguification, so perfect as to perform their Office.

And here it may not be amiss to remark, that the Lungs of a *Fetus*, before it has breathed, are so dense and heavy, that if they are thrown into Water they will sink; but if the *Fetus* be born, and breathes but half a dozen times, they become so spongy and light, that they will swim; which may be of good Use to discover whether those Infants that are said to be murder'd by Whores, were *Still-born* or not; for if they were *Still-born*, their Lungs will sink, but if *born alive*, they will swim. *Gibson.*

After London has been described, the Author

The

*The Conduct of Nature, in forming an
Animal from an Egg.*

BEFORE Incubation, we find in the *Tunick* of the Yolk of the Egg, a little white Spot, in the Fashion of a Circle, like a small *Lentill* call'd a *Ciccatrice*; which, during the Sitting of the Hen, dilates itself, and the very *first* Day stretches into several Circles, and on the *second* we may observe a clear shining Liquor, finer than Christal, which is call'd a *Jelly*; the *third* and *fourth* Day we perceive in that *Jelly* a Streak of florid Blood, and the *Punctum saliens* in the Middle of the *Jelly*; which is the first Formation, or Discovery of the Heart: Afterwards we may observe something else, (besides that Point) thick, and whitish like a Cloud, divided into two Parts; the biggest of which is the Matter for the Head, where we may see four little Bladders, which are the Brain, the *Cerebellum*, and the Eyes; the other Part is much less, and underneath is represented the Keel of a Ship, by the Spine of the Back (if in an human *Fœtus*) and by degrees one may see the Arms and Legs, the *Viscera* clinging to the Vessels that convey and inclose the Blood, and so bring the *Fœtus* to Perfection. The *Fœtus* is inclosed in the *Ciccatrice* before Incubation, and likewise the Parts of a Chicken pre-exist (potentially) in the Egg, and precede the Incubation, and increase successively (according to the Order of Time) from the first Impregnation of the seminal Spirits, according to the Will of the Creator.

Sometimes it happens, that in a Hen's *Egg* are found two Yolks, with their *Whites* divided by a very thin Membrane; and yet such an Egg, (tho' facundated by the Communication of the Cock)

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being

50 *The forming an Animal from an Egg.*

being set under the Hen, will seldom produce two distinct Chickens, rightly formed, but one *only*, and *that* monstrous, with four Wings, four Feet, four Heads, &c.— And that, by reason that the Membranes that should divide them are broke, and so the two Chickens close so intimately, that they can make no other than a monstrous Production; and the same Thing may happen in the *Ova* of Women.

All the solid Parts of the Body are contain'd in the *Animalcule*, or else in the Egg, or in both conjunctly; so that *Accretion* and *Nutrition* are nothing but the *Repletion* and *Distention* of the Vessels, the most proper Food adding *nothing* to the Substance of the solid Parts of the Body; and if so, there can be no *Equivocal* Generation; nor can any Matter, however disposed, frame itself into solid Parts, unless Omnipotence puts it into Motion; and this Doctrine may serve to shew the Possibility of the Resurrection of the *same Body*; for if Nourishment is only a Fluid, in a continual Flux, and all the solid Parts of the Body are *only* the original *Stamina*, then no Parts of an Animal can become Part of another Animal, altho' nourish'd by its Substance; but the Body is always the same, from the *first Moment* to the *last Article* of Life.

Two remarkable Histories of an Human Foetus, found in the Fallopian Tube.

AND now I think it not improper *here*, to give the curious Reader the Substance of a Letter from Dr. Cyprianus, to Sir Tho. Millington, containing the History of an human *Fetus* of 21 Months, taken from the *Fallopian Tubes*, before the Death of the Mother.

He says, That on the 17th of *December*, Anno 1694, he was call'd to see the Wife of a Soldier, 32 Years of Age, big with Child, about the 9th Month of her Reckoning, but could not perceive any Milk in her Breasts. Her Burden seem'd heavier than ordinary, and more troublesome, especially when it stirr'd; and it seem'd also to be situated *higher* than usual. When the Time of her Delivery was come, the *Fætus* moved with great Violence, and much Pain to the Woman; yet no breaking of Water, nor other usual Signs of the Child's being near the Birth; and at length the Child ceased to stir, which gave Ground to believe it was dead. After 10 Months, the *Menstrua* flow'd, tho' never 'till now, all the Time of her *Gestation*. She felt also a heavy troublesome Load, but no Motion of the Infant, and Accidents continually increased; 'till towards the 18th Month, the Woman was forced to take to her Bed, when she had a great Pain in her Navel and Parts adjacent, which was succeeded by a fungous Ulcer in the umbilical Region. In the 21st Month from the Conception, he says, that he, with several others, (which he names) were called in to her Assistance; and after diligent Search, he gave it as his Judgment, that the *Fætus* was lodg'd in the right *Fallopian Tube*. And he proposing to the Woman to open her, to take it out, *she consented*. And then he passing a Probe into the Ulcer, he open'd the *Abdomen* on the right Side, and then putting in his Fore-finger, perceived he had gotten into the Tube, and putting his Probe-Scissars on his Finger, made a large Incision at one Stroke on that Side, and then the *Fætus* presented itself to View: Then he dilated above and below, to the Length of a Foot, and pressing down the Intestines with his Left-hand, took out the *Fætus* entire.

52 *A Fœtus found in the Fallopian Tube.*

Having made this last Incision, he first saw the Head of the *Fœtus*, with its Feet stretched towards the *Diaphragma*; the Navel-String by the *Placenta*, adhering to the *Tuba Fallopiana*: The Cavity from whence the *Fœtus* was taken, was cover'd with a *Mucilage* like a purulent Matter, which he found not to be *Pus*, but the Remainder of the Water of the *Amnios*, but no internal Part ulcerated. The Cavity was hollow, like a large Purse, and joined to the *Peritoneum*, and its lower Part adhering to the right Side of the Womb, towards its Bottom, which was the Place of the *Tube*; the *Ovaria*, and left Tube, having received no manner of Damage. He cleansed the Cavity of the *Mucus*, stitch'd up the Wound, and cured it; and the Woman went abroad again in less than three Months, and was again with Child, and safely deliver'd of a Daughter, on the 2d of *January* 1696, and in 1697 was deliver'd of Twins; which was a certain Sign that the left Tube was not at all injur'd, for had it been so, she could never more have conceived at all: And that is the Reason why sometimes, after bad Labours, Women become barren; the *Placenta* adhering more firmly than ordinarily, and being tore off by the Midwife with too great Violence, the inner Parts have been left lacerated and raw; and having been at last, with Difficulty, healed, the End of the Tube has been closed by a *Ciccatrice*, and so not only an Outlet for another *Fœtus* render'd impossible, but the Tube itself made incapable of expanding or opening its upper Part, to receive another Egg from the *Ovaria*, &c.

But now to resolve this *Phænomenon*, how it is that a *Fœtus* should lodge in the *Tube*, and there be nourish'd and grow: The Reason seems to be the Straitness of the Tube: Or its End, next the Womb, being (contrary to Nature) imperforate, (either

(either from the Birth, or by some Accident) it cannot possibly pass through the Tube into the Womb, as it ought, and so stops in the Tube, contrary to the Design of Nature, &c.

Another curious History.

Monfieur Buiffiere in a Letter tells us, that he open'd a young Woman that had been executed, in whom he found that the Left *Fallopian Tube* was dilated towards its Extremity, little less than an Inch in Diameter, and stretch'd almost an Inch and an half in its Decrease from the Side of the *Matrix*. This Part being dilated, bent itself back, and embrac'd almost all the *Ovarium* from the Membrane, to which, it was so firmly knit, that it could not but by Force be separated. When it was torn off, there flow'd from it a limpid and unctuous Liquor, whose Use was to relax the Membranes of the *Tubes*, and so dilate them, that the *Ovum* might slip more easily into the *Matrix*; and says it is his Opinion, that this Liquor comes from the *Ovarium*, and that the Fibres and small Lymphatick Vessels, &c. that break, to open a Passage for the impregnated Egg, let this Liquor flow; so that a Rent of the *Ovary* makes a Wound, and produces a Liquor which is useful, if not necessary, either for the first Nutrition of the Egg, or to facilitate its Passage through the *Tube*; and adds, that in a Sow, in the same Condition, the *Cornua* on each Side, that embrac'd the *Ovary*, contain'd each of them 3 or 4 Ounces of this Liquor.

The Tube of this Woman being loos'd from the *Ovarium*, and the Liquor empty'd, an Egg appeared naked, of the Bigness of a Hazel Nut, surrounded with Liquor, $\frac{3}{4}$ of the Egg being slipp'd out of the *Ovary* by the Hole which it had made, so that it look'd as if it was held by nothing; yet

54 *The Formation of a Fœtus in an Ovarium.*

when he went to remove it, he found it hanging by a hard String, 'thwart of which run the Blood-Vessels to supply it, both within and without, by which the *Fœtus* receiv'd Growth and Nourishment.

Abstract of a curious Account of the Formation of a Fœtus in an Ovarium, taken from the Journal de Medicine, publish'd at Paris.

THE Narrative is in Substance thus : A Lady, whose Name was *Madam de St. Mere*, after having had eight Children, and now five Years since the last, insomuch, that she thought she should have no more, till about three Months since (says the Journal) she suspected herself to be fallen into *that Condition* again, because having never fail'd of being very regular, and not finding herself ill, she was more than a Month without her ordinary Relief; but whilst in this State, there was a little *Show*, which scarcely left her wholly during the two last Months of her Life, which she pass'd (however) without much Trouble, so that she thought herself secure, as to the Point of her being with Child; but after she was up one Morning, in very good Health, she fell into *Deliquium*, and lost her Pulse from that Moment; yet her Speech and Understanding remain'd, but her Countenance was deadish, and cover'd with a cold clammy Sweat, complaining of a grievous Cholick in the Region of her Right Groin, terminating at the Reins, and immediately felt the *Preludium* of an approaching Travel; but there appear'd outwardly neither Distillation

nor

nor Flooding, nor any Sign of this Disorder; yet her *inward* Agonies were such, that she call'd out for her SURGEON, saying, *I am Delivering, I am Delivering*, and dy'd in his Arms *that Moment*.

Her sudden Death made them curious to enquire into the Cause of it, and therefore it was resolv'd to open her Body; which being done, they found in the *Epigastrick Region* all the In-trails floating in Blood; and after having taken out two Pounds with a Spoon, to avoid changing the Situation of the Parts, and finding that there remain'd in the right Flank a prodigious Quantity *coagulated*, they (in taking of it out) drew forth a little *Foetus* about the Bigness of a THUMB, in which was discover'd the Sex of a Male, but without any Covering.

Two Fingers from the Place was found the right *Tube*, the Testicle torn length-ways, and thro' the Middle, on the Side that it did not touch, the *Tuba Fallopiana*, and all its Cavity, full of clotted Blood; from whence no doubt remain'd, but that *this* was the Place where the *Infant* was formed, and that having acquired in here a Growth too great to be able to *fall* in Time, and having continued to grow there, without being able to come forth, it had at length broken the Prison, by stretching it.

When *this Testicle* was compared with the other, it was found to be four times bigger; its Bulk approaching that of a Hens Egg, and the *other* not bigger than a Chesnut; it was red both without and within, besides the clotted Blood it contain'd; whereas *the other* was pale and full of little Grains, of the Consistency and Colour of yellow Tallow. The *Tube* on the Right Side was strictly examin'd, and it could not be perceiv'd that this *Infant* had ever enter'd *there*, it being in all Things *exactly* like the Left *Tube*. The

56 *The Formation of a Fœtus in an Ovarium.*

Womb was also in a State *purely Natural*, only a little bigger and softer than in Women who die without being with Child. A Probe was put into its Cavity by the *Vagina*, and then it was cut open, and not the least Sign of a Conception found *there*, only the Vessels of the interior Membrane appear'd full of Blood, and as it were *varicous*, which probably was the Cause of that *little Show* of Blood before mention'd. All the other Parts of the Belly and Breast were also examin'd, and found in a *natural State*; so that the Death of this Lady could be attributed to nothing else than the *Fœtus* first growing, and then breaking forth from, and lacerating the *Testicle*, instead of falling in *Time* into the Tube, according to Nature.

The following Case being very extraordinary, which occur'd to our famous Brother and Countryman Mr. Cowper, we have taken the Pains to deliver it in *Latin*, for the sake of our modest Readers, *viz.*

AD quandam Neonuptam annos plus minus viginti habentem accersitus, cujus Hypogastrium ad instar prægnantis extensum fuit, examinandis pudendis, Hymenem omnino impervium & ultra labia Pudendorum projectum invenimus: adeò ut primo intuitu, non aliter quam uteri prolapsus apparuit. Sursum scilicet Clitorim versus meatum urinarium solito magis patentem, & lateraliter extensum, Ano Gallino non dissimilem percepimus; perinde ut in vesicam urinariam quam facillimè Indicem perrexi. Hymene diviso tantum Sanguinis, Consistentiæ & Coloris mirè diversi, ex Utero profluit, quantum ad Congium implendum sufficeret;

ret; & proximo die non minus profluvium, pello quem indideram remoto, erupit intra triduum maximè relevata fuit, & in paucis diebus, optimè convaleuit; atque intra Spatium ejusdem anni Infantem sanum & robustum peperit. Maritus nobis retulit quod sibi æquè ac uxori plus doloris quam voluptatis primus Conubitus præbuit; attamen usu introitum facillimum invenisse, quem nisi per meatum urinarium habere non posset.

A curious History of an uncommon Case of a Dropsy, contain'd between the Coats of the Uterus, from the Philosophical Transactions for January 1693.

A Woman upwards of 44 Years of Age, sometime after Mariage, fancy'd she had the Symptoms of Pregnancy, and consulted a Midwife; and at the Expiration of her Time, she fancy'd her Pains came on, and she believ'd herself near her Labour.

Her Belly was grown gradually big from the Time of her fancy'd Conception; yet now the supposed Labour wore off, and all Preparations for it for that Time were fruitless; and thus she continued growing bigger, 'till twice the Time of her Reckoning was expir'd; which puzzled all those which she consulted, not being able to determine what her Case was: Some thought she had a Tympany; some that she was Ascitical, and others that she went with a dead Child.

She took much Physick, without any Relief, and at length apply'd to an eminent Physician, who after a strict Enquiry into her Circumstances, gave her Hopes that she was with Child, and that by taking his Prescriptions, she should speedily be

58 *Of an uncommon Case of an Uterine Dropsy.*

be deliver'd of an human *Fœtus*, either dead or alive; yet his Remedies also failed, and now she began to despair of Recovery, yet liv'd many Months afterwards.

At the End of three Years after her first *supposed* Pregnancy, she apply'd to a Man-Midwife, who put her under a Course of Physick again, wherein she took many *Histerick* and *Uterine* Medicines, altogether as much in vain as before; and now it was concluded that she went with a *Mola*, whose Expulsion was attempted without any Success; so at length she remov'd into the Air, where, in some small Time, she languish'd and dy'd.

It was then concluded to open her Body, to find out the Cause of this *occult Malady*, that had baffled *all Art*. The Corps being laid on a Table, as much for Advantage as possible, Incision was made from the *Umbilicus* transverse the *Abdomen* to the *Iliæ*, and from the same Centre another Incision direct to the *Os Pubis*. Here was now great Expectation on all Hands of something rare and *monstrous*, when on a sudden one of the Dissectors, little thinking what was so near, in cutting thro' the *Peritoneum*, accidentally thrust his Knife too far, and immediately there arose a Spring of limpid *Serum*, or *Lympha*, as clear as Water from a Fountain, with great Impetuosity, and to a very considerable Height. This put an End as well to the Conjectures as Disputes about it, all being now convinc'd that it was a *Hydrops Uteri*, or a Dropsy contain'd in the Cavity of the Womb.

Having empty'd the containing Part of its Water, which somewhat exceeded two Gallons, they proceeded to enquire wherein this *Deluge* had been contain'd, and that was in a thin, transparent Membrane, which, when turn'd to the Right Side, they

Of an uncommon Case of an Uterine Dropsy. 59

they perceiv'd underneath it, or adhering to it, a more *carnous Substance*: And the more clearly to find out what this was, the *Os Pubis* was divided by a small Saw, and then a Probe was pass'd thro' the *Pudenda* into the *Vagina Uteri*; and having traced it as far as it went, by looking into the *Pelvis*, and searching for that *carnous Substance*, they found it to be the *Uterus* itself; when cutting into its Body, they perceiv'd the End of the Probe already enter'd into the Neck thereof; so that now they were convinced, that the aforesaid Water was contained in the external Tunick of the Womb, whose great Weight had thrust the Body thereof perfectly on one Side, and hinder'd an Admission of Search from the *Vagina* towards the *Fundus Uteri*, the *Cervix* whereof being kept close, as in a true Conception.

One of the great Indications of this Woman's Pregnancy was a Flux of a whitish Humour to her Breasts, which she could squeeze out at Pleasure, and thought it to be no less than *Milk*. She had likewise, the greatest part of the Time, a Suppression of the *Menses*, which together confirm'd her in the Belief that she was with Child.

Of the Saliva, or Spittle. Its Origin and Use.

FROM the *Carotidal Glands* spring the *Salival Ducts*, by many small Roots, that immediately unite into one Trunk, and run on the Outside of the upper Jaw, quite to the Centre of the *Buccinator*, and there open into the Cavity of the Mouth, into which they discharge the *Saliva* which they imbibe out of the *Parotis*.

The *internal maxillar Glands* are immediately placed *within* the lower Jaw: They have each a proper Vessel, or *salival Duct* arising out of them, as the conglomerate *Parotides* have, which are called the *Inner salival Ducts*, as those which spring from the *Parotides* are call'd the *Outer*.

These running on the *Inside* of the lower Jaw, as those do on the *Outside* of the upper, they spring by many small Roots out of the hinder Parts of the Glands, and run right forward towards the *Chin*; and when they are come to the Middle of it, they end just within the Gums, and have each a *Papilla* fix'd to their Orifice, to discharge the *Saliva* out of them *into* the Mouth, and yet suffer nothing to return out of the Mouth *into* them.

There are also *glandula sublinguales*, seated on each side by the Tongue, and are of the same kind with those of the *Cheeks*, only their *excretory Vessels* are narrower.

They run parallel to one another from the Tongue towards the Gums, penetrating the investing Coat of the Mouth, at a small Distance from the Gums, with such small Orifices, that without pressing them, they are scarcely *perceptible*.

The Use of all these Glands is to separate the *Saliva*, and to discharge it into the Mouth by the *salival Ducts*.

As to the Original of the *Saliva*, it is most probably derived from the arterial Blood: For as the Arteries afford *nutritious Juice* to all other Parts, so they do the same unto the Glands, a Part of which they convert into their own *Nutriments*, and that which is *serous* they separate; upon which they bestow a *subacid* Quality, and so it becomes what we call *Spittle* or *Saliva*, which very probably, is impregnated with some *nervous Juice*; because all these Glands have nervous Twigs inserted in-

to

to them; and *this may be the Reason*, why the taking much Tobacco is pernicious to such as are lean, and of a dry Habit, and that *spit much*, with their Smoking, bringing on *Palsies, Atrophies, &c.*

The *Saliva* serves to help the Digestion, Comminution, and Liquefaction of the Food in the Stomach, in order to the making of *Chile*, which the Reader may see more of, where we have treated of Sanguification and Nutrition, and in the next Section following, which treats of the *Chile*, and which we think very naturally follows the *Saliva*, because it is produced by its Help.

Of the Chile; the manner of its Production, and its Use: Being another Explication of Sanguification.

CHILE is a pretty thick white Juice, like *Barley Cream*, which the Food is converted into by *Digestion*; and *Digestion* is the *Dissolution* of the *Aliments* into such very small Parts, as renders them fit to enter the *Lacteals*, in order to circulate, and be converted into Blood.

The principal Agents to induce *this* sort of Action are the *Saliva*, the Juice of the Glands of the Stomach, and the Liquors we take in to our Stomachs, which, entering the Pores of the *ingested* Aliment, swell them, and breaks their *Cohesions*, in which they are assisted by the Heat of the Stomach, and which rarifies the Air contain'd in the Pores of the Food, and *so also* helps to divide its Parts; and for this purpose, *Water* seems to be the *most proper*; for notwithstanding some *spirituous Liquors* more easily penetrate the Substances we eat, yet *their Particles* have an attracting Force, which, received into our Food, instead of swelling and dissolving it,

it, (as they ought to do) they contract, harden, and draw their Parts nearer together: *Yet however*, they may sometimes help Digestion (when they are properly diluted) by irritating and provoking the Stomach to a stronger Contraction, when the Spring of its Fibres are too weak, &c.

The Food, *thus prepared*, is divided into *integral Parts*, and which the *Liquor* in the Stomach (by the perpetual Motion of its Sides) divide into a *Fluid*; and which, by its *alternate Contractions*, and Force of the neighbouring Muscles, is cast over the *Pylorus* into the Intestines; in the Entrance of which it is mix'd *with* and diluted by the *Bile* and *Pancreatick Juice*, which are there smoothly and quietly mix'd with the *Chile*, without any manner of *Effervescence*, only, by their Help, the *Chile* is render'd more fluid (whatever some ingenious Men have said to the contrary), and now, by the peristaltick Motion of the Intestines, and the Pressure of the *Diaphragma* and *Abdomenal Muscles*, the *thinner* Part is strain'd thro' the small Orifices of the *Vena Lactea*, and the *grosser* carried downwards, to be sent off by *Stool*.

But it is to be remembred, that the *Saliva*, and Juice of the Stomachick Glands, do no farther help Digestion, than to mollify and render the *ingested Aliment* easier of Digestion: Nor do they spontaneously flow into the Stomach to forward that Digestion, but as the Motion of the Teeth, Gullet, and Stomach effect it, by expressing *those Liquors* into the Stomach from the aforesaid Glands: And *those Liquors alone* will *not* perform Digestion; for if they are mixed in any place *as hot*, or *hotter*, than in the Stomach, with *Flesh*, *Bread*, or *Herbs*, they will never convert into *Chile* by all the Art of Man.

But this Action of Chilification is better understood by Mr. Boyle's *Digesting Engine*, in which there

there is no need of a Fermentation, but of Heat; and the Pressure of rarify'd Air, which not finding a Passage out, will (with the Addition of a little Water) dissolve *Flesh*, and even *Bones*, into a perfect *Jelly*, which wants but little of the Nature of *Chile*.

The Chile is carried by the Lacteals from the Intestines to the Glands of the *Mesentery*, where it receives a thin *Lympha* from the Lymphaducts, which farther dilutes it: So that to the forming of it aright, (1.) The *Saliva* (2.) The Juice of the Glands of the Stomach. (3.) The *Bile*. (4.) The Pancreatick Juice. And (5.) the *Lympha*; all lend their Assistance.

Now, a better Digestion is perform'd in the Day-time, whilst we are awake, than in the Night, when we sleep; because, *when awake*, we oftner *respire*, and so exercise the *Diaphragma*, the *abdomenal Muscles*, and the whole Body more, and so oftner compress the Stomach: By which means the Aliment is sooner pounded, mix'd, and liquify'd, that is, it is sooner digested; and in Winter our Digestion is better than in Summer, *because* in the Winter we exercise our Bodies more, and with quicker Motion.

Those who labour hard, have commonly a good Digestion, because by Motion the digestive Humour in the Stomach, as it is poured more upon the Aliment, so a fresh Supply is more plentifully generated from the Blood, and brought to the Stomach. But here arises a Difficulty, (*viz.*) why Digestion is weaken'd in hot Weather, since, according to modern Philosophy, Heat consists in a quick Motion of Bodies; and, on the contrary, when the Air is cold and motionless, the Digestion is stronger. Now, this *Phenomenon* they solve thus: (*viz.*) The digestive Humour, by reason of the great Heat, is too much attenuated, and is evaporated by the great Opening of the Pores; and tho'

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tho', by Motion and Exercise, the Blood is greatly heated, yet there does not happen such a great Opening of the Pores, *except sometimes*, from very violent Exercise, from whence Digestion is not assisted: And for this Reason, *they say*, Cold Baths increase both Appetite and Digestion; and, on the contrary, that Hot ones lessen *both*.

This Solution, tho' it seems to have *something* of Weight in it, yet is not *fully* satisfactory: For tho' in Winter, with *great Exercise*, there is much Sweat, and a great Dissipation of Matter, yet the Appetite and Digestion is promoted; and it is not easy to believe, that in *such* a Case the digestive Humour should not be considerably dissipated, since, from the *same reason*, we suppose that the Digestion grows languid; therefore there seems to be a Disparity of Reason between the Summer's Heat, and that caus'd by Exercise; from whence we may suspect, that in Chilification there is a certain Matter concurs, which is taken from the Air in the Use of Respiration, which is more plentiful, and endowed with greater Activity in Winter than in Summer.

Of the Urine; the Modus of its Secretion, and the Structure of the Kidneys.

THE Kidneys are seated in the Loins behind the Stomach and Intestines, one on each side the *Vertebra*. Their lower Ends rests upon the Muscle *Psoas*, just where the Nerve enters it; which is the Cause of that *Numbness*, which is felt in the Thigh of the same Side, when a large Stone is in the Kidney, and presses upon the Nerve.

The right Kidney is generally larger than the left, and lowest also, because of the *Largeness* of the

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the Liver; but it has not so much Fat as the left, because of its *Nearness* to the Liver, whose Heat hinders the Growth of its Fat. The right Kidney is join'd to the *Cæcum*; (and sometimes the Liver) and the left to the Colon and Spleen.

The Kidneys consist of globular Glandules, like so many distinct Kidneys: The *emulgent Artery*, springing from the descending Trunk of the *Aorta*, enters the Kidney in its inner and concave Side, being first divided into two; but after its Entrance, is subdivided into many Branches, which still spread into *smaller* between the Coats of the *Pelvis*; and these, with the similar Twigs of the Veins, run thro' the whole Substance of the Kidney, and end in the aforesaid Globules.

By this Artery, Blood is convey'd to the Reins, not only for their Nourishment, but *principally*, that in their *Glandules*, great Part of the *Serum* may be separated from it, which being carried by the urinary Tubes to the *Papillæ*, is secern'd thro' them into the *Pelvis*.

The *emulgent Vein* has the same Ramifications within the Kidneys, as the Artery, and its Trunk springs out near where the Artery enters and opens into the *Cava*, into which it discharges the Blood that remains after the Nourishment of the Kidney, now freed from a good Quantity of *Serum* in the Glands.

Within the Kidney there is a Cell call'd *Pelvis*, or the Bason, which is only an Extension of the Head of the *Ureter*, and which branches out into 8 or 10 large Tubes: Into this the *Serum* issues, from the Urinary *Siphons* thro' the *Carunculae Papillares*; for one of these stand at the Head of each of the said Tubes, being equal in Number to them, of about the Bigness of Peas, flat above, and convex next to the *Pelvis*, and whose Perforations are so exceeding small, that they will hardly admit of an Hair.

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In the Middle, between the *Aorta* and Kidneys, a little above the emulgent Vessels, are situated the *Glandula renales*, one on each Side, being two in Number, inclosed in Fat; they change their Figure, and their Situation is not always the same: In a *Fetus* they are almost as big as the Kidney, but their Use is not yet certainly known.

The *Ureters* are too long small Canals, springing from the *Pelvis*, one on each Side, and descending in a *Curve*; they penetrate the Bladder near its Neck, where they run a little Space between its Coats, and then open into it, to discharge the Urine into its Cavity.

The Use of the Kidneys is to separate the Urine from the Blood, which by the Motion of the Heart and Arteries, is thrust into the two emulgent Branches which enter the Kidneys, and then are divided into four or five, and they again into more, 'till they at length End in the smallest *Capillaries*, which terminate in the Glandules, into which they infuse their Liquor; by which the Serosity being separated, is receiv'd by the Orifice of the little Tubes, which go from those Glands to the *Pelvis*, from whence it runs by the *Ureters* into the Bladder,

The Blood which could not enter the Glands, is brought back by the emulgent Veins to the *Cava*, and so to the Heart. The Urine thus separated, consists of much Salt, floating in Water, for which Reason the Kidneys have their Situation so near the Heart; for were they at a greater Distance, other Particles would have united with the Salts and aqueous Particles, and hurt their Secretion; besides, it had been impossible for so much Blood to have washed thro' them, at a greater Distance, as now there does.

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The Urine, by Examination, is found to contain nothing but common Salt and Earth; for if one takes a Quantity of it, and in a Sand Heat evaporates the Humidity, till the *Faces* is as thick as Honey, and then throws upon the same *Faces* as much Rain Water as was evaporated from it, *this new Addition*, by the Assistance of a small Digestion, will become as perfect an urinous Liquor as it was when it came out of the Bladder, and so it shall continue after several *the like Repetitions*.

It has been disputed, whether this Separation of *Serum* in the Kidneys is caused by any Kind of Fermentation, or whether it is done *meerly* by *Percolation*; but since wiser Heads have disagree'd about the Matter, we shall not take upon us to determine it; only we will say, that the Discharge *that Way* (upon smart Drinking more especially) is generally so quick, that there seems to be no *Time* for any Fermentation at all; and we must stand amazed at the wonderful *Mechanism* of those Parts, that so suddenly strain such *Quantities* of Serum thro', and yet admit of not the least Drop of Blood to pass with it.

All the Parts of the Creation bespeak a Deity, *but none more* than the wise Contrivance, which appears in the Structure of *all* the Parts that compose an human *Machine*; when we consider *which*, we must cry out with the Psalmist, *I will praise thee, for I am fearfully and wonderfully made; marvellous are thy Works, and that my Soul knoweth right well. My Substance was not hid from thee, when I was made in Secret, and curiously wrought in the lowest Parts of the Earth. Thine Eyes did see my Substance, being yet unperfect, and in thy Book all my Members were written, which in Continuance were fashioned, when as yet there was none of them, &c, Psal. 139. 14, 15, 16.*

And now, before I conclude this Head, I must crave Leave to declare against that scandalous Practice of *casting* of Urine, as it is call'd, a Thing practis'd only by Quacks, and believ'd by old Women. These *Urinal-Peepers*, without seeing the Patient, or having any Opportunity of asking such Questions as are proper to let them into the Knowledge of the Distemper, (had they a Capacity to understand it, which few of this Tribe have) pretend to tell not only the Distemper, but in what particular Part or Limb it is seated; whether it is a Man's or Woman's Water, &c. (which they pick out of the silly Messenger that brings it) and if a Woman's, if she is with Child or not, and whether of a Boy or Girl, with many other such Fooleries, which all Men of tolerable Education are ashamed of; and he that has but a moderate Knowledge of the animal OEconomy, and the Nature of the Fluids, must be conscious to himself that there is *nothing at all in it*, it being a knavish Practice, in Use only amongst ignorant Pretenders, to bubble the Credulous, and to deceive those that want to be deceived; for if at any Time they tell you all the Particulars of the Case, distinguish the Sex, and the like, it is what they pump out of the Unwary, or do it by their *Setters*, or Creatures that they employ on purpose, to pick it out of the Urine-Messenger; and then privately inform *them* of the Particulars, by which some of them get the Name of *Conjurers*, when indeed they are far enough from deserving any *such Title*, altho' a scandalous one.

And to speak the Truth, in many Cases the Urine is no Guide at all; altho in *some* it may be a Help, when one can inspect it and attend the Patient every Day; but not a tenth Part can be discover'd by it, of what a *few* Knaves make *many* Fools believe; nor enough of *it self* to induce a prudent

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prudent honest Physician (without farther Examination) to prescribe to any Patient.

Indeed in the *Jaundice* the Urine is Yellow, so it is also if the Patient has taken *Rhubarb*: Oftentimes a Person in *perfect Health* shall void a turbid foul Urine, whilst others near their *Exit* shall make one (seemingly) much better; particularly in malignant Fevers it will often look like that of a Person in Health, because the Disease is rather seated in the Spirits than the Blood.

High colour'd Urine commonly shews some great Inflammation in the Blood, but no Man upon Earth can say, by looking on it, that the Inflammation or Pain is in any *particular Part*, as the Urine-Casters do.

Sometimes in Fevers, when the Matter takes to the Head, and threatens Convulsions, a *pale* Urine is made, yet much the same colour'd Water comes from Histerical Persons, or those labouring under Obstructions, or after drinking of Rhenish or *French* White Wine.

A purulent Water, we say, indicates an Ulcer, a wheyish slimy one, a Stone therewith; yet we are not to trust to this *alone*, without asking many Questions, with respect to the Course of Life of the Patient, and Seat of the Pain, and the like.

A large mealy Settling commonly shews an inward wasting, yet some that lead a sedentary unactive Life, and eat and sleep much, and grow corpulent, will however make *such* a Sort of Water.

A Patient under a Fit of the Cholick, will often make a lixivial and high colour'd Water, and in a small Proportion; and one in the Dropsy shall do the same.

A bloody Water commonly indicates, that the Kidneys are affected, yet a Blister Plaister laid to the Neck, will *sometimes* do the same, and not

only produce a Strangury, but bring away Slime and Skins like those from an Ulcer, or Stone in those Parts.

If, then there be this Uncertainty in making Judgment on the Urine, that even the wisest of Physicians never trust to it, and at best take it only as a *fallible* Guide, what do those Wretches deserve who take the Urinal for their Standard, and under the specious Pretext of being abler Doctors than all others, deceive poor credulous People, by pretending not only to tell them every minute Circumstance of their Distemper, but in the Urinal can see the Liver upon the point of rotting, the Spleen in danger of a *Schirrhous*, the Stomach *inverted*, the Pancreas out of Place, the Lungs mortify'd, and a whole *Bundle* of this dismal *Nonsense*, to fright poor People out of their Money, whilst these Knaves live in Plenty, and laugh at those they deceive.

He that would see this Trick handsomely exposed, we would refer him to a Book wrote many Years since (we think by Dr. *Harvey*) call'd the *Piss-Prophet*, where the Rascality of these Pretenders is wittily and merrily exposed.

And to close this Head, we must also shew our Dislike to that nasty Practice, of Persons drinking their own Urine in several Distempers, as if amongst the infinite Variety of excellent Medicines that the Almighty had furnish'd us with, there was none like an *Excrement*, and one too that very much partakes of the Disease that afflicts us, and which, tho' it could do nothing to help us, whilst in our Bodies, yet we resolve to take it into them again, that it may be double distill'd, that so we may be superlatively filthy; and it may justly (if it were good for any thing) be call'd, *auxilium abominabile & execrandum*; yet People do not stop here, but as if they delighted in Variety

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of Filthiness, there are some, and those mostly *Rheumatick Mortals*, that regale themselves with *Cows Piss*: I am apt to think, that drinking of *Cows Piss* for a *Rheumatism*, and licking of Dogs-T—d and Honey for Inflammations of the Tonfils, are much of a standing, and come in when Philosophy was in its *Leading-Strings*, and Ignorance and Superstition were very rampant; but whoever he was that first made the *mighty Discovery*, that the Piss of a Cow, and the Dung of a Dog, were such *Rarities* in Medicinal Practice, altho' we do not know his Name, yet we may know that by Nature he was a *very nasty Fellow*; and whoever make Use of them, have a better Digestion, and less *queasy* Stomach than I have; and he that first fancy'd these two Things good Medicines for the Purposes aforesaid, might as well have advised a Piece of a Joint-Stool to cure the *Cholick*, or to apply a Gridiron to a *gouty Limb*, and with equal Reason and Philosophy.

Of the Stomach, its Structure and Office.

IT is plac'd under the *Diaphragma*, which it toucheth, *principally* by its two Orifices, and that is the Reason that sometimes, upon a full Stomach, a difficulty of Breathing is felt, because such Fulness is a Pressure upon the *Diaphragma*, and obstructs its Motion.

On its fore Part, and *right Side*, it is cover'd by the Concave Part of the Liver; on the *left*, the Spleen touches it, as does the *Aorta* and *Vena Cava*, and towards the Back, and under it, (backwards) the *Pancreas*, and more forward, the *Colon*.

If we consider the Proportions of Bodies, it is less in Men than it is in Brutes; and tho' it is

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the *Magazine* for the whole Body, it is said not to weigh $\frac{1}{2}$. Part of it; it is lesser in Women than in Men, and hangs cross the Body, and its two Orifices stand higher up than its Middle, so that it makes a Sort of *Semi-lunar* Figure.

It is join'd on the *left* (where its upper Orifice is) to the Gullet, and on its *right* (or what we call the *Pylorus*) it is continued to the *Duodenum*. Its Bottom (in its whole Length) is connected to the upper Part of the *Omentum*, by which it is also join'd to the Liver, Spleen, Back, Colon, and *Pancreas*.

It is composed of four Coats; the *first*, and innermost, is made up of short Fibres, that stand perpendicularly upon the Fibres of the next Coat: It is larger than the rest, and full of Wrinkles, especially about the *Pylorus*, which prevents the Chile from running out of the Stomach, before it is sufficiently digested. In this Coat also are a great Number of small Glands, which separate a Liquor that helps the Concoction of the *Aliments*. The *second* is thinner and nervous, and therefore of exquisite Sense: The *third* is muscular, and made up of strait and circular Fibres, and so wisely contriv'd, that by their Action, both Sides of the Stomach are drawn towards its Middle, and the whole equally contracted. The *fourth* Coat is common, and comes from the *Peritoneum*.

The *innermost* Coat of the *Pylorus* is very wrinkled, and the *middlemost* has two Ranks of Fibres; those which run lengthways draw the rest of the Stomach to the *Pylorus*, to distribute the Chile into the Guts; and (on the contrary) when these Fibres are contracted at the other End, they often draw the *Pylorus*, towards the *Left*, as in *Vomiting*; and when the Convulsion is continued farther by violent Strainings and Ejections, the *Duodenum* is drawn upwards, and from thence the *Succus Pancreaticus*

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aticus and *Cholar* (which is commonly seen in over violent Vomitings) is pump'd up out of the *Duodenum* into the Stomach, and so cast forth by the Mouth.

The Stomach hath many Veins, which serve to carry back again to the Heart the Remains of the Arterial Blood, which is not spent on the Nourishment of the Part; tho' some Anatomists affirm, that besides the Arterial Blood, the Veins receive the more subtle Part of the *Chile*, for its readier Conveyance into the Mass of Blood, and from *thence* draw a Reason for the *very sudden* Refreshment that hungry and faint Persons receive by Eating and Drinking.

It has Arteries also, which accompany every Vein, and which most Anatomists have been of Opinion, do not only convey Blood to the Stomach, for its Nourishment and Warmth, in order to help Digestion, (as the Antients generally imagin'd) but they also cast out of the Glands of the Stomach (into its Cavity) a spirituous Liquor, which joining with the Remainder of the *Chile*, that sticks in its downy Coat, forms that Juice which *they call* the Ferment of the Stomach.

It hath Nerves from the *Par-vagus*, whose Trunks passing down by the Sides of the Gullet, are each divided into two Branches, *viz.* the *outer* and *inner*, which quickly become *one*, and passing with the Gullet thro' the *Diaphragma*. on the Outside of the Orifice of the Stomach, spreads itself in its Bottom.

Both inner and outer Branches, as they pass, one on one Side, and the other on the other Side of the upper Orifice of the Stomach, send out many Ramifications, which *inofculate* and make a Net-like *Plexus* there; and from this great Number of Nerves spread in the Mouth of the Stomach, proceeds that great Consent that is betwixt *that* and

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and the Head; so that many times on receiving Con-
cussions of the Brain, there succeeds a Vomiting, and
from a Foulness of the Stomach, the Headach, &c.
And for the same Reason, at this Orifice is the
Sense of Hunger most prevalent; which Sense is
“ caused from fermentaceous Particles, partaking
“ of Acrimony, bred of *Saliva* swallow’d, and
“ other saltish or acid Things, that are eat or
“ drank; which sticking to the Coats of the Sto-
“ mach, and brought to some Acidity by it, or
“ remaining in it after the *Chile* is sent off, and
“ affixed to its inmost wrinkled Coat, (especially
“ about its upper Orifice) molest it by their *Vel-*
“ *lications*; which being communicated to the
“ Brain by the Nerves of the eight Pair, an Ima-
“ gination of taking Meat is excited, to assuage
“ that troublesome Corrosion. *Diemerbroeck Anat.*
Corporis humani, cap. 6. p. 39, &c.

The *Action* of the Stomach is Chilification; but
how that is perform’d, may be found under pro-
per Heads in this Work, so that it is needless to
repeat it here.

Of the Intestines; their Mechanism, &c.

THEY are ty’d together by the Mesentery,
and continued from the *Pylorus* to the *Podex*;
they are of a membranous Substance, and thinner
in the small Guts than in the great, and the nea-
rer the *Rectum*, still thicker; and they are said to
be about six times the length of the Person, and
are contriv’d to be of such a length, for divers
wise Ends and Purposes, as (1.) That the *Chile*,
by its long Stay in the Guts, might have the bet-
ter *Admixture* with the *Bile* and Pancreatick Juice,
and so be made fine enough to pass the Lacteals
by

by the *Peristaltick* Motion of the Guts, and Impulse of the Muscles of the *Abdomen*, which are moved in Respiration. (2.) That a Person may not be always hungry, which he must be, if the *Chile* had not time enough to be elaborated and distributed ; which had been impossible, had not the Guts been of the Length and Figure that they are. (3.) That we might not always be wanting to *exonerate* ; which is the Case of all those voracious Animals that have Guts running strait, from the Stomach to the *Anus*.

They have three Coats like the Stomach ; its innermost is nervous, and is lined with a spongy Substance, which serves as a strainer for the *Chile* to pass thro' into the *Vena Lactea* : This Membrane in the *Ileum* is full of Wrinkles, to hinder the too sudden Passage of the *Chile* ; and it is also expanded in the *Colon* into little Cells, that the *Fæces* may pass the more slowly. In this Coat abundance of Glands are found, especially in the *Ileum* and towards its lower End, tho' but few in the *Duodenum* and *Jejunum*, and always on that Side of the Gut only that is opposite to its Adhesion to the Mesentery. In the small Guts they are in Knots, but in the large ones they are single, yet larger than in the other, and have every one a distinct Pore.

Now these are supposed to separate a glutinous Serum from the Arteries, and a Nitro-aqueous Spirit from the Nerves, which being mixed together, (in the small Guts) help to perfect Chilification ; and in the large ones they make a clammy Humour, that fences the Guts against the Hardness of the Excrements, and glue their Particles together into a due Consistence.

The Intestines have Veins, which receive their Blood from the Arteries, and carry it back to the Liver, and so to the Heart ; they have Arteries
also

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also to convey Warmth and Nourishment to them, and (when the Body is distemper'd) to carry *thither* the Impurities of the Blood, upon taking a Purge, or *critically* to pass out by Stool; and it is probable, that such Arteries as terminate in the Glands of the Guts, do spue out thro' them into the Guts the slimy Humour that *bedaub*s the Inside of them, for the more easy Excretion of the *Fæces*.

They have Nerves also for their Sense and *Peristaltick* Motion; and the Guts are six in Number, three small and as many large ones, *viz.* *Duodenum*, *Jejunum*, *Ileum*, *Cæcum*, *Colon*, and *Rectum*.

In the *three first* the Chyle is found, and in the *three last* the *Fæces*.

(1.) The *Duodenum* is continued from the *Pylorus*, and no Part of it join'd to the *Mesentery*, but to the Membrane of the *Omentum*. Towards its lower End, but not always *exactly* in the same Place, there are *most commonly* two Ducts leading obliquely into it.

The *first* is the *Ductus Choledocus Communis*, by which the *Bile* from the Liver enters this Gut; and a little below this is the *second*, call'd *Ductus Pancreaticus*, which empties the *Succus Pancreaticus* into this Gut also; tho' sometimes *both* these Ducts are join'd into *one*, and then *both* open into it by one Mouth.

(2.) The *Jejunum* is (for the most Part) empty, *principally* because of the great multitude of *Venæ Lactææ* that enter it. It begins where the *Duodenum* ends, and is continued to the *Ileum*, from which it may be distinguish'd by its Emptiness, and greater Number of Veins and Arteries, as also by the Nearness of the Folds of its inmost Coat.

(3.) The *Ileum* begins where the *Jejunum* ends, and is seated under the Navel; and fills both the *Iliæ*; it is the longest and narrowest of all the Guts,

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Guts, being, as affirm'd by some, at least 20 Feet in Length, and but a Fingers Breadth in *Diameter*. This is the Gut that falls down into the *Scrotum*, in an *Hernia Intestinalis*, and in this Gut happens the Iliack Passion, where the *Excrement* is often vomited up.

(4.) The *Cæcum*, call'd also the Blind Gut, because in this the *Fæces* both go in and out at the same *Orifice*. It seems to be an *Appendage* rather on the *Colon* than *Ileum*, and is bigger in an Infant than in a Man; and when they are new born, it is full of *Excrement*, it serving as a Storehouse till after the Birth, that they go to Stool.

(5.) The *Colon* begins at the *Os Ileum*, on the right Side, and ascending by the Spine, it arrives at the right *Kidney*, to which Parts it is joyned, and from thence, bending to the left, it slides under the Liver, by the Gall Bladder, (which tinges it there a little Yellow) to the Bottom of the Stomach, and is ty'd to its whole Length, by the Mediation of the *Omentum*, as it is also to the *Pancreas* and Loyns, and afterwards to the lower Part of the Spleen, and after divers Turnings, at last it empties itself into the *Rectum*. Its Length is reckon'd near 7 Feet, and goes almost quite about the *Abdomen*, next to the Muscles, that it may be the more conveniently compressed by them, for voiding the *Excrements*. It has many Cells, for the slower Passage of the *Fæces*, that we may not have a continual nor over-hasty Occasion to go to Stool; it has a Valve, where it is joyned with the *Ileum*, which so stops the Hole that is common to the *Ileum* and *Colon*, that *Flatuosities* cannot ascend, nor the *Excrements* regurgitate, unless the Valve be ulcerated, and then they may be ejected by Vomit; and Glisters may then ascend up to the Stomach, as in the *Iliaca Passio*, &c.

(6.) The

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(6.) The *Rectum* has its Beginning where the *Colon* ends, and passeth strait down to the Extremity of the *Coxis*, and is ty'd on its *back-side*, both to *that* and the first *Vertebra* of the *Os Sacrum*, (by the help of the *Peritoneum*) to keep it from falling out ; and in Men its *fore-side* grows to the Neck of the Bladder, *from whence* (when there is a Stone in the Bladder) there *generally* happens a *Tenasmus* ; and in Women it is ty'd to the Neck of the *Uterus* ; but in *both* there is a musculous Substance goes between.

The *Sphincter ani* is at the End of this Gut, which compassing it about, contracts it so, that nothing can pass out, unless we voluntarily relax it. The *Rectum*, or its *inner* Membrane, often jetteth a little out in going to Stool, and is *then* what is commonly call'd the falling down of the Fundament.

Of the Mesentery ; its Structure, &c.

THIS is a fat membranous Part, that not only conveys some Vessels to the Intestines, and others *from* them, but ties *most* of the Guts together *so* artificially, that tho' they are 8 or 9 Ells long, and have manifold Windings, yet they are not entangled ; and tho' all its *Circumference* is but a Span from its *Centre*, yet it comprehends all the Guts, except the *Duodenum*, and Part of the *Rectum*.

Its *Circumference* is about 3 Ells in Length ; and the Intestines, which are ty'd to it, are about 9 Ells ; so that to every Inch of *Circumference* are 3 Inches of the Intestines fasten'd.

The

Of the Mesentery ; its Structure, &c. 79

The Mesentery is composed of 3 *Lamina* ; on the *inner Lamina* the Glands and Fat lie, and the Veins and Arteries run , and the other two cover this on each Side. Between the two external *Lamina* run the Branches of the *Arteria Mesenterica*, which bring the Blood to the Intestines, and the *Vena Mesenterica*, which carry the Blood back to the Liver. The *Vena Lactea* and the *Lymphaducts* likewise run upon the *Mesentery*, in which are many Glands, that receive the *Chyle* and *Lympha* from the *Vena Lactea*, &c. which are treated of in other Parts of this Book, and to which we refer.

It is here likewise, that all the large Branches, both of the Veins and Arteries, communicate with one another, and march to the Guts, where they divide into very small and numerous Branches, and spread themselves upon the Coats of the Intestines.

The Mesentery has many little softish Glands, the biggest of which is fix'd in its Centre ; and when these Glands grow schirrous, or are so obstructed, that the Chyle cannot pass thro' them, there follows a *Fluxus Cæliacus*, or *Chylosus*, which continuing, there succeeds an *Atrophy*, and the Party dies Consumptive.

Of the Venæ Lactææ ; their Use, &c.

THESE were first found out by *Casper Assellius* about the Year 1622 ; they are pellucid Vessels, of a single Cover, so fine, that when they are empty of *Chyle* and *Lympha* it is impossible to see them. They are dispersed thro' the Mesentery, and their Use is, to carry the Chyle from the Intestines ; they spring from all Parts of the small

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Guts,

Guts, by fine *Tubes*, which, as they run from the Intestines to the Glands in the Mesentery, unite, and form larger Branches; their Mouths are smaller than the smallest Arteries in the Body, that nothing might enter them, that should afterwards retard the Circulation of the Blood.

The same Extremities of the Lacteals have also Communication with the Capillary Arteries of the Intestines, by which they receive a *Lympha*, that dilutes the Chyle, and carries it forward, and washes the Lacteals and Glands, that they may not be obstructed upon Fasting, &c. when the Chyle stays longer than ordinary in them.

The other Extremity of the Lacteals, discharges the Chyle into the vesicular Cells of the *Mesenterick Glands*, and from these arise other larger Lacteals, which carry the Chyle immediately into the *Receptaculum*. All the Lacteals have Valves at certain Distances, which hinder the Chyle from returning into the Intestines.

How the Chyle circulates, and is converted into Blood, and the Nourishments of the Parts, is accounted for in other Places of this Book.

Of the Lymphaducts and Lympha; their Use.

THEY are in Figure long and hollow, like a Vein, but exquisitely small and knotty, having many Valves, which permit the *Lympha* to pass to the *Chilipherous Vessels*, (and to many Veins) but forbids its Return.

They are pellucid and Christalline, consisting of a transparent thin Skin, which entirely disappears

appears when broken, and the *Lympha* let out; their Number almost exceeds Arithmetick; and *Malpighius* says, that they always proceed from Glands, and arise from all Parts of the Body; for all the Fluids, except the *Chile*, are separated from the Blood in the fine Capillaries, by a different Pipe from the Channel in which the Blood moves; and be it what it will, it is still a Gland, whilst it permits some Part of the Blood to pass thro' it, and denies a Passage to the rest. Now the Lymphatick Glands are so small, that they are invisible to the finest Microscope, but their Ducts unite and inlarge, as they approach the Heart; yet do not open into one common Channel, as the Veins do, but they run by one another, and communicate by short intermediate Ducts; which unite, and then presently divide again; and in their Progress they never fail to stop at one or two *conglobate* Glands, into which they discharge themselves.

At some times the Lymphaduct Tube opens at several Places into the Gland, and at other times it only attends in two or three Branches the principal Duct; passing over and joining those Lymphaticks arising from the opposite Sides of the Glands, sending their *Lympha* to the *Receptaculum Chili*.

Those under the *Diaphragma* discharge their *Lympha* into the great Receptacle; those of the *Thorax*, Head, and Arms, into the *Ductus Thoracicus*, *Jugular*, and *Subclavian* Veins; and *Ruyssch* affirms, that by Ligature and the Structure of the Valves he has plainly seen, that all the Lymphaducts in the Lungs discharge their *Lympha* into the *Subclavian*, *Axillar*, and *Jugular* Veins.

If the *Lympha* be chymically analized, it will be found to contain much *Volatile*, but no fixed Salt; some Flegm, Sulphur, and a small Portion of Earth.

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Etmuller says, that the *Lympha* is nothing but the *Serum* tinged with the nutritious Juice of the *Spermatick* or nervous Parts, which it collects in the Glands, and carries from *thence* to the Blood by the Lymphaducts.

Bartholine thinks it to be the simple, superfluous *Serum* of each Part, brought thither by the Arteries.

And *Glisson*, That it is a Liquor condensed from the *Halitus* of the Blood.

Diemerbroeck, That it is a fermentaceous Liquor, separated from the serous Part of the Blood, in the *Conglobate* Glands, impregnated with much fused and volatile Salt, and some sulphureous Particles; which, when in the *Vasa Chilifera*, makes the *Chile* thinner, and apt to dilate easily in the Heart.

It differs from the *Serum*; for if a little of the *Lympha* be gather'd in a Spoon, and let stand, without setting it over a Fire, it will turn to a *Jelly*, which the *Serum* will not do.

We know not its Use, *with any infallible Certainty*, but it mixes itself with the Blood in the Axillary Vein near the Heart, and enters presently into the Right Ventricle, and then into the Lungs and Left Ventricle of the Heart, which conveys it to all the Body; *from whence* some think, that it helps to repair the vital Vigour of the Blood; and that *this* is what Supplies us with *Saliva*, and the Stomach with a *Dissolvent*, and that it nourisheth the Parts; and above all (and which seems to be its particular Office) it dilutes and perfects the *Chile* before it mixes with the Blood, and is apt to make the Blood more fluid, and not ready to ferment nor coagulate.

Of MILK.

How it is generated.

THE Breasts are compos'd of a great Number of Glands, of an oval Figure, whose Ducts, as they approach the Nipple, unite together, 'till at last they form seven or eight small *Tubes*, call'd *Tubuli Lactiferi*; which communicate by divers cross Canals, and terminate in the Extremity of the Nipple.

It was an ancient (tho' erroneous) Opinion, not only that the *Fætus* was nourish'd by its Mother's Blood, but that Milk was also made of Blood sent from the Womb by the Epigastrick Vessels, *ascending* and *inosculating* with those Branches of the *Mammariæ* that *descend* towards the Navil; but we know that those *Anastermoses* are a meer Fiction, invented to serve an *Hypothesis*, and that *neither* is the *Fætus* nourish'd by the Blood of the Mother, nor is Milk made of it.

As to the *first*, we have said enough where we treated of the *Semen Virile*; and to the *second* we say it cannot be true; for then the Mother would suffer the Loss of *so much Blood* as the Child suck'd Milk from the Breasts, sometimes to the Quantity of a Pint, or a Pint and an half every Day; which is by no Means to be believ'd, some Women being not at all the weaker or fainter, but rather the more lively and strong for giving Suck, and *none* so very weak as the Loss of *so much Blood daily* would be a Means of.

Besides, *this* would be *doing* and *undoing*, first to make Blood of *Chile*, and then *again* to make *Chile* of Blood, the *Chile* being *only* a Sort of Milk; but

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to come at the Truth, Milk is made of *Chile* after this Manner, viz.

After the *Vena Lactea* have discharg'd the *Chile* into the common *Receptacle*, it ascends up by the *Ductus Thoracicus*, and passes into the *Subclavian Veins*, where mixing with the Blood, it circulates with it thro' the *Ventricles* of the Heart ; and when by the *Aorta* it comes out of the *Left Ventricle*, that Part of it which is not assimilated to the Blood, is carry'd to the Breasts by the *Mammary* and *Thoracick Arteries*, whose *Capillaries* are inserted into the Glands, thro' which it is seerned into the *Tubuli Lactiferi*, after the Manner that the *Serum* of the Blood is separated from it by the Glands of the Kidneys into the *Tubuli* of the *Siphons*.

And as those carry the *Serum* into the *Pelvis* of the Kidneys, so do these the Milk into the common *Cistern*, where it remains 'till the Child (by the *Tubuli* which run from the said Cistern to the Nipple) sucks it out : And the Blood (that came with the *Chile* to the Glands) returns back again into the *Subclavian* and *Axillary Veins*, and so to the Heart. Now the Reason why the *Chile* flows to the Breasts only at some certain Times, and not always, altho' its Stock is never exhausted, nor the Vessels that carry it defac'd or destroy'd, is, according to *Diemerbroeck*, from a more strong intense Imagination or Desire of the Mother to give Suck. *Anat. Corp. Human. lib. 2. cap. 2.* But Men of good Understanding tell us, that the Tubes which compose the *Mammary Glands* in Maids, contract so closely, that not the least Part of the Blood can enter them ; but as the Womb is big with the *Fœtus*, it compresses the descending Trunk of the *Aorta*, and causes the Blood to flow in greater Quantity, and with greater *Velocity* thro' the Arteries of the Breast, and so forces a Passage into

into their Glands; which Glands, at first, because of their Narrowness, admit only a thin Water, but they grow bigger as the Womb does, and so the Glands receive a thicker *Serum*, and after the Birth they run with a thick Milk ; BECAUSE that Blood which before flowed to the *Fætus*, and three or four Days afterwards by the *Uterus*, being stopp'd, does more dilate the *Mamillary* Glands.

But *then*, if so, as soon as the Womb was empty'd of the *Fætus*, the Pressure of the *Aorta* would cease, and the Blood would flow as usual thro' the Arteries of the Breast, whose Glands would again contract, and the Milk dry away, (that is, if what is said just now was true) notwithstanding the Blood that formerly flowed to the *Fætus*, and afterwards by the *Uterus*, is stopp'd; for if that *so dilated* the mamillary Glands, as to cause Milk to flow with a constant Course, the Milk would ever flow, 'till the *Menstrua* return'd, and then it would at once dry up; neither of which is true.

And therefore we deny both the Certainty of this Way of Reasoning, and the Power of Imagination, to produce such an Effect; and yet notwithstanding are not asham'd to confess our Ignorance of the Cause hereof; and shall, with Dr. *Gibson*, resolve it into the *wise* Disposal of the *All-wise* Creator, being well assured that no Man, by all his Searching, could ever yet find out God (nor by all his Scrutiny could define the Reasons of Millions of Beings in the Creation) to Perfection; nor give *one* satisfactory Reason for many of the Operations of his Hands, they being, like to himself, *Incomprehensible*.

Of the MENSES.

THEY are Monthly Evacuations from the *Uterus*, which begin at the Time of Puberty, which generally is at 14, (and seldom exceeding 15) Years of Age, which is twice seven, and End generally at about 49, which is seven times seven, Nature regulating her Motions *herein* by that Number: And *here*, as in every other Production of Nature, the Wisdom of an infinite Creator is evidently display'd, if we observe, (1.) That the *Vagina Uteri*, as well as the whole Body, is *perpendicular* to the *Horizon*; whereas in all Brutes it is *parallel* to it. (2.) The internal Membrane of the Womb and *Vagina*, and into which there are dispersed great Numbers of Veins and Arteries, is very thin, and without any fat. (3.) That the Blood-Vessels in this Part are exceeding numerous, especially in the Womb, where the Arteries *inofculate* with the Arteries, and the Veins with the Veins, and the Branches on *one Side* of the *Matrix* with those on the *other*, which do not meet in strait Lines, but are composed of divers *Curvities* and Windings; which Structure is absolutely necessary at the Time of being Pregnant, or else the Vessels would be so pressed as to burst, or obstruct; whereas by this *Curvedness* they give Way, and the Passage of some are always kept free. (4.) That the descending Trunk of the *Aorta* is much larger in Women than in Men. (5.) That the *Uterine* Veins have no Valves.

That

That they appear at certain Lunar Revolutions is very certain, but why at *such Times* more than any other, I am not ashamed to confess myself ignorant of the Reason of it; but it is agreed by many, that they are produc'd by an extraordinary Fermentation in the Mass of Blood, by a spirituous Leven receiv'd from the Testicles and Matrix, which causes the Blood to swell and distend its Vessels, and makes it flow with greater Velocity; which causes Pains of the Loyns, Tension and Pulsation of the Arteries in those Parts, and about the *Os Sacrum*, till at last the Blood makes its Way by the Lymphatick Vessels, which open into the Neck of the *Uterus*, in which they have their Insertion, for nothing flows by the Womb itself.

Now as in Women that give Suck, the *Chile* passes in a large Proportion to the Breasts, and the Blood *thereby* being defrauded of its due Share, does not increase so as to need lessening by the flowing of the *Menfes*; so in pregnant Women there is so large a Quantity of the *Succus nutritius* (which is nothing but *Chile* a little refined, and impregnated with vital Spirit) that passes to the *Placenta* by the Hypogastrick and Spermatick Arteries, for Nutrition of the *Fætus*, that the *Menfes* commonly intermit after the first Month; and this is the true Reason why Women with Child want them, and *not* because the *Fætus* is nourish'd by its Mother's Blood, as some have (*not truly*) supposed.

Two Grand *Emmenagogicks*, now in Use, are Steel and Hellebore; where the *Menfes* are obstructed in a plethorick Habit, Steel is very improper, and will sometimes raise Histerick Commotions and Convulsions; but Hellebore attenuates the Blood, and disposes it for this Discharge,

charge, without causing it to be more impetuous; so that tho' both Steel and Hellebore help the *Menstrual* Discharge, yet *Steel* does it by increasing the Blood's *Velocity*, and giving it a greater Force against the *Uterine Arteries*; and *Hellebore*, by thinning and dividing it, and making it more fluid.

Besides Steel and Hellebore, there are many Things given for the same Purpose; but for the sake of Brevity, we shall only name three the most common, (*viz.*) *Mugwort*, *Savine*, and *Mirr.*

Mugwort, by *Analysis*, yields an acid Phlegm, urinous Spirits, and a concrete, volatile, and fixed Salt; which qualifies it to correct the Acidity of the Blood, rendering it more fluid, and fit to open Obstructions.

Savine contains a pretty deal of a biting Oil, and some Volatile Salts; from whence some think its perpetual Verdure proceeds.

Mirr. is a Rosinous Gum, and abounds with oily Parts, united to some Volatile and some Earthy ones, which appear by Anallyzation.

As to *Chalibeats*, they are spoken to sufficiently under another Head.

Of the LOCHIA.

DR. *Fuller* has said something so very pertinent relating hereto, that I shall repeat his Sense, in his *Pharm. Ext.* 256, 257, 258.

Their Stoppage is most frequently owing to intense Pain, which, disturbing the orderly Motion of the Spirits, convulses the Fibres, constricts the Membranes of the *Uterus* and *Vagina*; and so, purging up the Mouths of the Vessels, suppresseth the due Flux; and therefore Opiates, which take off those Pains, Hurry of Spirits, and Constriction of the Fibres, must needs promote that Purgation, which is sufficiently vouch'd by Experience, altho' many are against it. And Dr. *Willis* says, that if there be a Suppression of the *Lochia*, with a violent Perturbation of the Blood, Vomiting, Thirst, and Watching, he has often known *Laudanum*, mix'd with Saffron, given with happy Success.

And Dr. *Sydenham*, after Tryal of *Emmenagogicks* to no Purpose, gave one single Dose of *Laudanum*, join'd with *Emmenagogicks*; and says, however astringent *Laudanum* may be of its own Nature, yet since it composeth the Perturbation of the Spirits, it sometimes helps mightily, and recovers the desired Flux, when forcing Things will do nothing. But if upon giving it once, the *Lochia* do not follow, it must not be repeated; for if it be, it will so stop them, as never to be recover'd by any Art.

Perhaps this Caution of the Doctor's, may be right enough, where there is a total Suppression of them, from Loss of Spirits, and Failure of Nature,

Nature, occasion'd by a hard Labour, and Flooding. But otherwise, when the *Catamenia* flowed not freely enough, and Strength was not wanting, I have seen where *Laudanum*, duly repeated, hath brought them down fresh again, quell'd hysterick Vapours, caus'd Rest, and supported more than the highest Cordial could do.

Of Sensation in general.

IT is an Action of the finer and most fluid Part of Bodies upon the Organs of Sense: The *Impulse* is by *them* transmitted to the *Nerves*, appropriated for such particular Sense, and from them to the Brain. Thus (*for Example*) in Seeing, the Light reflected from Bodies, is carried thro' the Humour of the Eye, and congregated upon the *Retina*, just as it was reflected upon *that* Body; and so the *Impulse*, after a suitable Manner, strikes the Fibres of the *Optick Nerves*, and conveys the Impulse to the Brain. So in Smelling, Tasting, and Touching, the *Effluvia* of Bodies act *directly* upon the Nerves, and they send *immediate* Information of the Action to the Brain.

Of the BRAIN.

A General Idea of its Structure.

IT consists of two Parts; that which lies *most*ly in the fore Part of the *Cranium*, is called (in a proper Sense) *Cerebrum*; and that which lies on the back Part, and under the hinder Part of the *Cerebrum*, is called the *Cerebellum*; the whole Substance being contained in two Membranes, called the *Dura* and *Pia Mater*. The *external* Substance of the *Cerebrum* is of an Ash-Colour, and the *internal* white and fibrous. Of *this* the Nerves have their *Origin*. It reaches to the Extremity of the *Spinalis Medulla*, where it is divided into Fibres; and the external Substance of the Brain consists of *Circumvolutions*, resembling the small Guts; and in the Middle of each Winding is the Beginning of the medullary Substance. And altho' all the Nerves have their exquisite Sense imparted to them from the Brain, yet the *Substance* of the Brain itself is *wholly insensible*, which is a Depth too great for human Understanding to fathom.

It's *cortical* Substance is a Heap of oval Glands, that receive the capillary Branches of the Veins, and Arteries, belonging to the Brain, which disperse a very great Number of Fibres, and which all together make up the *medullary Substance*; which going out of the *Cranium*, form the Nerves, and *medulla spinalis*, contained in the *Vertebrae*, according to *Malpighius*.

The inward Substance of the right and left Side of the Brain, meeting together, and joining, leaves a Space that forms the three Ventricles, or *Centrum ovale*; and the Covering of this Space is called *Corpus callosum*; and the Bottom of this Space is the inward Substance of the two Sides of the *Cerebrum*, made up like two Bundles, and called *Crura medulla oblongata*; and upon them are the Prominences, call'd *Corpora striata*, and the *Thalami Nervorum Opticorum*: These *Crura* meeting together, make the Body, call'd, *Medulla oblongata*, on which are four Prominences, call'd *Nates* and *Testes*; and behind *these*, the internal and medullary Substance of the *Cerebellum* are divided into two Bundles, which form, upon each Side of the *Medulla oblongata*, three other Prominences; and then it passes out of the *Cranium* into the *Vertebra*, and forms the *Spinalis Medulla*; so that the Beginning of the Spinal Marrow is in the *Medulla oblongata*, which is three or four Inches in Length, within the Skull; and then it descends thro' the Hole of the hinder Part of the Head, and *Vertebra*, down to the *Os sacrum*, sending out ten Pair of Nerves to the Chest, Abdomen, and Limbs; and this is accounted the common Seat of Sensation, to which the Impressions made upon the Nerves, by external Objects, are returned.

The *Spinalis Medulla* is the Continuation of the *Medulla oblongata*, without the *Cranium*, which passes thro' all the *Vertebra* to the *Os sacrum*; and sends out thirty Pair of Nerves, which make their Egress by sixty Perforations, in the Spaces between the *Vertebra*, which are dispers'd on each Side to the Limbs, great Cavities, and other Parts, (*viz.*) seven to the Neck, twelve to the Back, five to the Loins, and six to the *Os sacrum*; which six do not come out at the Holes
on

on its Back-side, but at those on its Fore-side, and the last between the Extremity of the *Os sacrum* and *Os Coccygis*.

Of a Nerve.

It is a long small Bundle of hollow Fibres, wrapt up in the *Dura* and *Pia Mater*; which last not only covers all the Nerves in general, but every nervous Fibre, in the whole Body, in particular: And it is very probable, that each Fibre of a Nerve answers to some particular Part of the Brain, at the one End of it; and to some particular Part of the Body, at the other; that as Impressions are made upon such a Part of the Brain, the Soul may have immediate Intelligence that such a Part of the Body is hurt.

All the Nerves, as they pass out of the *Medulla Spinalis*, are divided into two Plans, by the *Pia Mater*; and as soon as the Nerves are come out of the *Vertebra*, they send a Branch to one another, where they make a little *Plexus*.

Of the Dura and Pia Mater.

The *Dura Mater* is a strong thick Membrane, encompassing all the Brain: It sticks close to the Basis of the Skull, and its Sutures, by the Fibres and Vessels it sends forth to the *Pericranium*; and is fasten'd to the *Pia Mater*, and Brain, by the Vessels that pass from one to the other. It dispenses a Covering to all the Nerves which arise from the Brain, to the *Medulla spinalis*, and to all the Nerves which rise from it. It divides the *Cerebrum* into two, and hinders it from pressing on the *Cerebellum*. The *Pia Mater* has the same Use

Use, and is a very delicate, yet double Membrane; lying under the *Dura Mater*, and immediately covers the Substance of the Brain. Its inner Membrane is very large; and runs in between all the Foldings of the Brain, to separate them, and sustain the Blood-Vessels, which make many Circumvolutions upon it, before they terminate in the Substance of the Brain.

Of HEARING.

What it is, and how performed.

THE external Ear has its upper Part, called *Pinna*, and its lower, nam'd *Fibra*, or the *Lobe*. The outward Circle of the *Pinna* is call'd *Helix*; and the Semicircle within it is the *Antihelix*; and the lower Part of that Semicircle is named *Antitragus*, it being opposite to another Circle, call'd *Tragus*.

The Cavity made by the Extremity of the *Helix*, is nam'd *Coucha*, and the Hollow, in the middle of the Ear, *Alvearium*; which has a Hole that leads to the *Timpanum*, which Hole is call'd *Meatus auditorius*, the Extremity of which is clos'd with a thin, transparent Membrane, stretched out like the Head of a Drum, and is called *Membrana Timpani*.

When this Membrane is removed, a Cavity appears on the Inside, in which are contain'd four little moveable Bones, viz. (1.) *Malleolus*, or, the little Hammer. (2.) *Incus*, the Anvil. (3.) *Stapes*, the Stirrup. (4.) *Os orbiculare*, so called

led from its Shape. Besides these Bones, which contribute to the Hearing, there are several Holes in the *Timpanum*, helping the same: The first is in its Fore-part, near the *Membrana Timpani*, and is the Entry to the *Sinus*, in the *Processus Mamillaris*. The second is the Orifice of a Pipe, leading to the Palate of the Mouth. The third and fourth are in the internal Process of the *Os petrosum*, the one of which is called, *Fenestra ovalis*, and the *Basis* of the *Stapes* stands upon it, and is in the Entry of the *Vestibulum*: The other is named *Fenestra rotunda*, and leads to the *Cochlea*, and the auditory Nerve, at five small Holes. The *Labyrinth* is compos'd of three Pipes of a semicircular Figure, excavated in the *Os petrosum*, and they open into the *Vestibulum* by five Orifices. The *Cochlea* is the last Cavity of the Ear, and is of a *spiral Form*, and is divided into two by a thin *Lamina spiralis*, the upper End of which opens into the *Timpanum*, and the lower into the *Vestibulum*. The Auditory Nerve enters, by the Hole, into the internal Process of the *Os petrosum*. And thus have we a short Account how these Parts are wisely form'd by the Great Creator, for the Reception of *Ideas* to be communicated to the Brain, from external Sounds, striking upon the Parts, now described, in this Manner, (*viz.*)

Sound is only a *Refraction* of the external Air; according to the various Refractions of which, the internal Air makes various Impressions upon the *Auditory Nerve* (which is the *immediate Organ* of Hearing); and so these *different Impressions* represent *different Sounds*, which are communicated to the Brain by the Auditory Nerve, *thus*: The external Air, being gather'd by the outward Ear, makes its Passage thro' the *Meatus auditorius*, and beats upon the *Membrane* of the *Timpanum*, which

moves

moves the four little Bones before-mentioned: And as this Membrane is beat by the *external Air*, those Bones move the *internal Air*, included in the *Timpanum* and *Vestibulum*, and so make an Impression upon the Auditory Nerve in the *Labyrinth* and *Cochlea*, according to the Motion of those Bones, and so conveys it to the Brain. And this is what we call *Hearing*.

Of VISION in general.

How it is performed.

IT is that Sense, whereby, from the different Motions of different Rays, gather'd in the chry-stalline and vitreous Humours, and striking upon the *Tunica Retina*, visible Objects are perceived.

Not to name all the Parts that constitute and help its Motions, (a Task too long for the Compass of this Work) we shall come directly to those Parts of it that contribute to the visive Faculty. The Globe of the Eye is of a *spherical* Figure, and in it are contain'd the *principal* Instruments of Vision.

It is compos'd of six Coats, or *Tunics*, and three *Humours*: The first Coat is nam'd *Conjunctiva*, the second *Sclerotica*, the third *Cornea*, the fourth *Choroides*, the fifth *Uvea*, and the sixth *Retina*.

The Humours are call'd (1.) *Aqueus*. (2.) *Chry-stallinus*. (3.) *Vitreus*.

The *Tunica Conjunctiva* composes the White of the Eye, and is full of small Veins and Arteries, which

which appear large in an *Ophthalmia*. The *Sclerotica* is thick, hard, and smooth, *opaque* behind, but transparent before; where it makes the *Cornea*, which is so call'd, because it is transparent, like a Horn, in the Fore-part of the Eye, which is surrounded by the White of the Eye; it has a greater *Convexity* than the rest of the Eye, and is made up of several parallel *Lamina*, that are nourished by a Multitude of Blood Vessels, but so *exquisitely fine*, as not to hinder even the smallest Rays of Light from entering the Eye, and has a most delicate Sense, that, upon the least Pain, the Tears might be squeez'd out of the *Lachrymal Glands*, to wash off any Filth, that might render the *Cornea* OPAKE, by adhering to it.

The *Choroides* lyes under the *Sclerotica*, and is much thinner; it has many Blood-Vessels, and Glands, which separate from those Blood-Vessels a black Liquor, that tinctures all this Membrane internally, which *otherwise* is of a whitish Colour. This Coat has a Hole before, called *Pupilla*, which is for a Passage for the Rays of Light.

The *Uvea* is made of circular and strait Fibres; it dilates and contracts, according to the different Impressions of Light and Objects: The *Iris* is the Outside of the *Uvea*, where the different Colours appear: On its *Inside*, from its Circumference, which joins the *Choroides*, springs the *Ligamentum Ciliare*; it is made of short Fibres, running upon the fore-part of the *vitreous* Humour to the Edges of the *Christalline*, as Lines from a Circumference, to a Centre: By contracting *these* Fibres, the fore-part of the Eye becomes more *prominent*, and the *Retina* press'd farther back from the *Christalline* Humour.

The *Retina* has its Name from the Resemblance it bears to a *Nett*, which covers the Bottom of the Cavity of the Eye: It is a fine Expansion of the *medullary Fibres* of the Optick Nerve, upon the Surface of the *Glassy Humour*, as far as the *Ligamentum ciliare*, and it is on this Coat that the Impressions of Objects are made: And so far of the Coats of the Eye; we shall now speak to its Humours.

1. The *Aqueus*; it lies under the fore-part of the Globe of the Eye, between the *Cornea* and *Crystalline Humour*; it is thin, liquid, and of such a spirituous Nature, that it will not freeze, if exposed to the Air in the most violent Frost: If the *Cornea* be pricked, and this Humour let out, it will be restored again in half twenty-four Hours Space. If any thick Particles swim in it, *then Flies*, &c. will seem to be playing before the Eyes; and if *these* Particles grow thicker, so as to cause a Film, and this be spread before the Hole of the *Pupilla*, it becomes a *Cataract*.

2. The *Crystalline*; it lies immediately next to the *aqueus*, behind the *Uvea*, opposite to the *Pupilla*, inclining rather to the fore-part of the Globe of the Eye: It is the least of the Humours, but more solid and bright than either of the other two. Its Figure is *Convex* on both Sides, but most so on the back Side; which makes a small Cavity in the vitreous Humour in which it lies; it is cover'd with a small Coat call'd *Aranea*.

3. The *Vitreous*; so call'd from its Resemblance to melted Glass; it is thicker than the *aqueus*, and thinner than the *Crystalline*, and exceeds both in Quantity; it fills all the posterior Part of the Globe of the Eye, and is contain'd in a very fine Tunicle, and gives the *Spherical Figure* to the Eye. Upon its Back Part is spread the *Retina*, which
it

it holds at a proper Distance from the *Chrystalline Humour*, the better to receive the Impressions of proper Objects more distinctly.

The *Cornea* is more convex than any other Part of the Eye, by which all the Rays are gathered to pass thro' the *Pupilla*, and none lost upon the *Uvea*.

When the *Pupilla* is contracted, we see more distinctly; but when it is dilated, we see most clearly.

The *Choroides* is tinctur'd Black, that the Rays of Light passing thro' the *Retina*, may not by reflecting back again, confuse the Image of the Object.

Of the Optick Nerves.

THEY are pretty big and round Bodies, and enter the Eye a little on the *Inside* of the Optick Axis: They rise partly from the Extremities of the *Corpora Striata*, and partly from the *Thalami Nervorum Opticorum*, which they almost embrace; from thence, approaching one another, they unite above the *Cella Turcica*, and then dividing immediately again, they pass thro' the foremost Holes of the *Os Sphenoides* into the Orbit of the Eye, where penetrating its Globe, their medullary Fibres spread themselves upon the *vitreous Humour*.

Their external Coat is a Production of the *Dura Mater*, and is continued in the *Scelerotis*, as their Internal is a Production of the *Pia Mater*, and is continued in the *Choroides*; and their medullary Fibres passing thro' all, are expanded into the *Retina*, on which are painted the Images of all visible Objects; but the Blood-Vessels which enter in with the Optick Nerve, center in this Expansion,

panſion, and render it inſenſible, and ſo darken it, that all Rays which fall upon it are loſt; but there is this evident Good receiv'd by the Optick Nerves being ſo inſerted on the *Inſide* of the Optick *Axes*, and an Inconveniency prevented, *viz.* if it had been inſerted in the *Axes*, the *middle Point* of every Object had been *inviſible*; and if it had pierced the *Outſide* of the *Axes*, we had loſt ſome Part of the Object, *becauſe* an Object may be ſo placed, as that all the Rays coming from *one Point* may fall upon the *Outſide* of both Eyes; but it is not *poſſible* that they ſhould fall on the *Inſide* of both Eyes, becauſe that Point which is loſt in one Eye, is viſible in the other.

All the Rays which come from the Point of one Object, are by the *Cornea* and Humours of the Eye, united in a Point of the *Retina*, which is drawn thro' the *Center* of the Eye, in a ſtrait Line from the *ſame Point* of the Object; and ſo conſequently all the Rays of the Object are united in the *Retina*, in the ſame Proportion and Order as the Points of the Object are.

In old Age it ſometimes happens, that the Globe of the Eye grows flat, and then the Rays paſs the *Retina* before they unite; and then there is no diſtinct Viſion; and, for ſuch, Convex Glaſſes are of Uſe.

But if, on the contrary, the Globe be ſo Convex, as to unite the Rays before they come to the *Pupilla*, there is the ſame Defect or Want of diſtinct Viſion: And here Concave Glaſſes are beſt.

Thoſe who are afflicted with the *firſt*, are call'd *Presbyta*, and the laſt *Myopes*, or Purblind.

Diſtinct Viſion is cauſed, when the Pencils of Rays from each Point of an Object do accurately determine, in correſpondent Points of the Image, on the *Retina*.

Confuſed

Confused Vision happens, when *these Pencils* do intermix one with another.

Clear Vision is produced by a great Quantity of Rays in the same Pencil, illuminating the correspondent Points of the Image strongly and vigorously.

Faint Vision is, when a few Rays make up one Pencil; and tho' this may be call'd *distinct*, yet it is *dark* and *obscure*, or not *so bright* as if there were the Concurrence of more Rays.

Of S M E L L I N G.

What it is, and how perform'd.

IT is a *passive Quality* of the *Olfactory Nerves*, in receiving the Impressions that *odorous Bodies* make by their *Exhalations*, (thus) *viz.* The little Atoms that exhale from odoriferous Substances, being carry'd by the Air to the Nose, strike upon its inner Membrane, and shake the small Pipes of the *Olfactory Nerves*; upon which the subtle Matter with which they are fill'd, partaking of the same Motion, flies immediately to the *Corpora Striata*, where these Nerves take their Rise, and then the Soul perceives that this is an Impression of an *odorous Body*.

The *Olfactory Nerves* are the first Pair, proceeding from the *Medulla Oblongata*, which we before describ'd; they arise from the Basis of the *Corpora Striata*, and passing thro' the little Holes of the *Os Cribriforme*, they are expanded upon the Membrane which covers the *Os Spongiosum*.

Our Design being the greatest *Brevity*, join'd with the utmost *Perspicuity* that our Bounds will allow, we shall omit giving the Anatomical Description of the *external* Part of the Nose, and only describe the *Internal*, as being more directly to our present Purpose, of treating of the Sense of Smelling, and which internal Part is understood to be the *immediate* Organ of it: It lies in the upper Part of the Nostrils, and is formed of the *Os Cribriforme*, and its Productions the *Os Spongiosum*, of which each *Lamina* is cover'd with a very fine Membrane, on which the Fibres of the *Olfactory Nerve*, (which passes the Holes of the *Os Cribriforme*) and the Fibres of the first Branch of the fifth Pair (which come from the Orbit of the Eye) are spread. There are several Conduits which open between these *Laminae*; the first and second are the *Ductus Lacrimales*, the third and fourth come from the *Sinus Frontalis*, the fifth and sixth from the Nut of the second Bone of the Upper Jaw, and the seventh and eighth from the Cells of the *Os Spongiosum*, and the ninth and tenth come from the *Sinus* in the *Os Sphenoides*; all these Conduits carry the Liquor which is separated in the Cavities to the Nostrils, for the moistening its Membranes, which otherwise would be apt to dry too much, by the *inspired* and *expired* Air.

The *Os Cribriforme* is so call'd from its *Sieve-like* Texture; it is fix'd in the Middle of the *Basis* of the *Os Frontis*, and has a great Number of Perforations, thro' which the Fibres of the *Olfactory Nerves* pass: In its Middle is a small Process call'd *Crista Galli*; from its Under-side goes a thin Bone, which divides the Nostrils into two; on each Side of which it has several small spongy *Lamina*, call'd *Os Spongiosa*, which make Part of the Orbit at the large *Canthus*. And this short
Account

Account we think sufficient, to give a general Idea of the Sense of Smelling, and of the Parts contributing thereto.

Of TASTING.

The Manner how it is performed.

IT is a Sense, by which the *gustable* Qualities of *relishable* Bodies are distinguished by the Organ of Taste, thro' the Motion of the Tongue, and Parts adjacent.

The *primary Organ* of Taste is the Tongue; but *that* being made up of various Parts, the learned do not fully agree as to the *particular Part* of it, in which this Sense is seated. *Diemerbroocke* affirms, that the nervous little *Papillæ*, into which several small Branches of Nerves, arising out of the Substance of the Tongue itself, are inserted and cover'd with a thin, nervous Membrane, are the *immediate Seat* of the Taste; or by that *porous Pellicle*, or slimy, fleshy Crust, invironing them like a Net, *this Sense* is brought to Perfection.

To believe that the Palate is the Seat of it, must be an Error, *because* by *that* it is impossible to distinguish the most *acrid* Substances.

The Substance of the Tongue is *musculous*, made up of *Plans* of Fibres differently directed. The first *Plan* is compos'd of *strait Fibres*, surrounding the Tongue, and reaching from its *Bas*is to its Point. *These*, upon Contraction, shorten the Tongue. Under them are several *Plans*, that

run

run from one Edge of the Tongue to the other; and, upon occasion, draw them together: And there are other *Plans*, that run from the *under* to its *upper Side*; and when they contract, they make the Tongue thin and broad. There are some Portions of Fat between these Fibres, but principally towards the *Basis* of the Tongue.

It has *Veins* from the *Jugulars*, call'd *Ranulares*, *Arteries* from the *Carotidals*, and *Nerves* from the 5th and 9th Pair.

It is cover'd with two Membranes; the *External* (particularly towards its *Tip*) hath a great Number of *Papilla*, of a piramidal Form, that stand not directly strait, but incline towards the *Basis* of the Tongue. Each *Papilla* has a small Root, that makes a small Hole in the viscous Substance that lies between the two Membranes. In some Brutes the *Papilla* grow *cartilaginous*; and in those which feed upon Grass, they are as so many Hooks for cutting and pulling it. The internal Membrane is thin and soft, and on it appear many *Papilla*, compos'd of the Extremity of the Nerves of the Tongue, and for that Reason are call'd *Nervosa*: They have their Seat on the Sides of the Tongue, but mostly towards its *Tip*. Their *Extremities* are round, and larger than the rest of their Bodies, resembling the Horns of a Snail. The Extremity of each *Papilla* penetrates the external Membrane of the Tongue; and these *Papilla* (as *Diemerbroocke* has observed, as is before noted) are the immediate Organ of Tasting, no other Parts having any direct Tendency to such a Sense, only as they do so accidentally.

Nitre has hardly any Taste; yet, when distill'd, it yields a corrosive Acid; which, after dissolving Silver, gives bitter Chrystals; and yet the same Spirit, when it has dissolv'd Lead, yields
a very

a very sweet Taste, altho' Silver and Lead are equally insipid; and if we take Silver Chry-stals, and pour Pickle upon them, and melt them on the Fire, they will become as insipid, tho' formerly very bitter, salt, and tart.

What Taste Nitre has, is betwixt a perfect In-sipid, and a gentle Bitter, and leaves a piercing Cold upon the Tongue. *These* partake more of the *volatile Acid* than *fix'd Alkali*, because they provoke to Urine, help Digestion, abate Thirst, and quell the Fermentations of the Blood, which they could not do, without keeping under the sulphureous Parts.

Gold dissolved in *Aq. Regia*, tastes like an un-ripe Sloe; and Sugar and Honey distill'd, produce very acid Spirits.

Insipid Things are such, whose Parts are not fine enough to make any particular Impression upon the Fibres of the Tongue, and so affect it with any Sense of a Taste.

Some Authors determine all Bitters to be gross and earthy; but most Bitters are compounded of *volatile, Alkaline*, moveable Salts, with a small Quantity of Sulphur. The volatile Salts stir up the Juices of the Body, unlock the Obstruction of the Passages, and throw out a great Part of the Ferments which they encounter, by the Pores of the Skin. If the Juices are gross and thick, they attenuate them; if acid, they beat down their Points, by the Motion they occasion, and qualify them for contrary Effects.

Dr. Grew says, That Bitterness proceeds from Sulphur well impregnated with *Alkali* or *Acid*, shackled with Earth.

And *Silvius*, That all bitter Things abound with volatile Salt; but we think it sound Doctrine to say that to constitute which, Oil and Sulphur concur, *L. II. c. 36. 80.* The Reader is at liberty to embrace which Opinion he pleases.

All

All Bitters are compounded of unequal, subtil, moveable Parts, which, by striking violently upon the Glandules of the Tongue, disturb the Repose of the Nerves, and so occasion an uneasy Sensation in the Soul.

It is commonly asked, Whether all Bitters are not *Alcalies*? The Answer is, They possess some volatile *Alcalies*, but they are more or less cramp'd or embarrass'd: And hence all Bitters do not give a green Tincture to Syrup of Violets, nor precipitate the Solution of Sublimate, nor ferment with Acids, as proper *Alcalies* ought, and generally do.

Bitters are such as rarify thick Humours, destroy the sharp Ferments in the Ventricle and Intestines, and qualify those in the Blood; and therefore the greatest Part of Stomaticks and Antifebreticks are of this Tribe.

Bitters kill Worms, either by their rapid Motion, driving their Parts into the Body of those Insects, or else by over-refining the Matter of their Nourishment, or, lastly, by stopping the Organs of Breathing, and so suffocating them.

The various Kinds of Bitters are the Occasion of the various Rarefactions of Humours, and Destruction of different Ferments. Thus those which contain more Sulphur than volatile Salt, cause a moderate Ferment, and Rarification of the Blood; which Fermentation increases gradually, as the Course of the Spirits is interrupted, and terminates in Sweats; and, on the contrary, those that are largely stock'd with Salts, and but little Sulphur, soon dissolve in the Blood and cause a great Rarification, opening the Vessels, moving the *Menses*, and sometimes bringing on the Piles; and of this sort is *Alloes*.

But now the *Cortex* (tho' a Bitter) having but few volatile Salts, and they qualify'd with a few *Acids*, is the

the Reason why it does not raise such a Ferment in the Blood, as Aloes, &c. and it being not possessed of much Rosin (as *Opium* is) it neither induces Sleep nor Sweat: However its Salts, tho' corrected by Acids, retain an absorbent, alkaline Quality, by which 'tis fitted to suck up the Ferments in Intermittents.

Bitter Medicines (in the general) do not rarify the Humours, nor grate upon the Solids so much as Acids, especially if they are a little tinctur'd with a styptick Taste, as in Rhubarb, and Wormwood, &c. And according to the different Bitterness of Medicines, we give them different Appellations: Thus the Bitter of Orange-Peel is *Aromatick*; that of Almonds, Apricocks, and Peach-Kernels, *oily*; that of Colloquintida, *austere*; that of Aloes, *sharp*; and that of the Cortex, *earthy*.

An urinous Taste springs from a Mixture of Acids and volatile Alcalies with some *Sulphur*.

A lixivious Taste is from fix'd alkaline Salts dissolv'd in Flegm; and a Wine Taste proceeds from a coarse *Acid*, melted in Flegm, and qualify'd by fix'd and volatile Sulphurs; and this Taste is applicable to almost all ripe Fruit, whose coarse Sulphur is in some measure attenuated by means of the Fermentation.

An *austere* styptick Taste is the Result of a coarser Acid than that of sweet Things: and when this Acid is refined, it affords a most agreeable Sweetness; and this is found in Fruit, when changed from its former Harshness, to a most delicious sweet Taste. Now whilst they are *unripe*, they are hard of Digestion, because they do not easily ferment, and so often cause Loosenesses; or if they do ferment, their Motion is so furious, that they often work the Blood and Spirits.

Spirits up into a Fever, a *Thing* well worth the Notice of all concerned in the Art of Medicine.

Of the H E A R T.

Its Structure and Use.

IT is a compound Muscle, made up of Fibres of the same Nature with other Muscles; but they have several Orders, and bear *different Directions*, and all their Tendons are in the *Basis* of the Heart. A much greater Number of Fibres involve the *left Ventricle* than the *right*; because the Blood, by *this*, is thrust *only thro'* the Lungs, but by *that*, thro' all the Parts of the Body, and back again.

It is the principal *Viscus* of the whole Body, and communicates vital Spirit and natural Heat to all the Parts; tho' these are not so much owing to its Substance, as to the Ebullition and Accension of the Blood and Chyle.

Its Seat is in the Middle of the Breast, encompassed with the *Pericardium* and *Mediastinum*, its *Mucro*, or Tip, inclining a little to the left. It hangs loose in its Case, suspended only by Vessels that go in and out of its *Basis*, to which the *Pericardium* adheres. Its Substance is thick and dense; *thinner* and softer on its *right Side*, *thicker* and more dense on its *left*; and its *Mucro*, most of all *hard* and *compact*.

If we consider the *Proportion* of Bodies, it is *larger* in Men than in other Animals; and is *less*,
but

but more *dense* in bold, couragious Men, than in the effeminate and *pufilanimous*.

It is cover'd with a proper Coat, which is strong and *dense*, but very thin; it is the same as the outward Coat of the *Aorta*, like as that which cloaths the Inside of the Ventricle, is continued and common with that thin Skin, which covers the Inside of the Arteries, like a *Cuticula*, the *Arteries* borrowing those Coats of the Heart, as the *Nerves* borrow their two Tunics from the *Pia* and *Dura Mater*.

The *Pericardium* springs at the *Mucro* of the Heart, from the outer common Coats of those Vessels that enter in, and has five Holes, according to the Number of Vessels that go in and out of the Heart, (*viz*) (1.) One made by the *ascending* Trunk of the *Cava*, another by the *descending*; both which enter the right Ventricle of the Heart, from whence go out two *Vena arteriosa* into the Lungs, which make a *third* Hole; a *fourth* is made by the *Arteria Venosa*, entering into the left Ventricle, and a *fifth* by the *Aorta*, going out of the same.

Its Outside adheres to the *Mediaſtinum*, and is continu'd to it, at the Basis of the Heart; and its lower-end is firmly knit to the *Diaphragma*, which *Bartholine* says is peculiar to *Men*, for that in all other Creatures it hangs loose. The *Pericardium* is a sort of Fence to the Heart; but the Liquor it contains serves for the moistening the Heart, and making its Superficies slippery, that it may move more glibly, &c.

This Liquor is *serous*, and in a healthy Person *reddish* like bloody Water; it is produc'd of Vapours exhaling from the Heart, which are stopt by the Density of this Membrane, and condensed into this Liquor, which is continually carried away again by its *Lymphaducts*, which absorb what is super-

superfluous, and empty it into the Lymphatick Duct. Its Quantity, *naturally*, is not above two Spoonfuls; but, in diseased Subjects, it often increases to half a Pound, or more. *This is that Liquor which is supposed to have flowed from the Side of our dear and blessed Saviour, when that Villanous profligate Soldier pierc'd it with a Spear, John xix. 34.*

The Heart has two Motions call'd *Systole* and *Diastole*; the *first* is, when its Fibres contract, its Sides swell, and its Cavities are strongly pressed on all Sides. The *second* is, when it ceases to act, its Fibres are lengthen'd, its Sides fall, and its Cavities become wide and large: Or, *more briefly*, *Systole* is the *Contraction*, and *Diastole* is the *Dilatation* of the Heart.

The Force of the Heart is to continue the Blood in Motion; but *how* it came *first* by *that* Motion, is a *Phænomenon* out of the *Ken* of human Understanding; but the Impulse of the Heart must be *equal* to the Resistance the Blood meets with in its Motion; for, if it was *more*, its Velocity would be continually *increasing*; and, if *less*, it would as continually *decrease*, till at length it would wholly *stop*: And it is evident that if its Circulation was once stopt, all the Force of the Heart could *never* put it in Motion again.

Great has been the Controversy amongst Men of Learning, concerning the Motion of the Heart: *Some affirming* that it depends on the Influx of the Animal Spirits, *some* on the Accension and Dilatation of the Blood in its Ventricles, and *others*, that it depends on *all*; which have served more to administer Matter of Contention, than to lead us to the *Truth*.

For that it cannot be from the *first only* is, evident, because in an *Embrio* the Heart moves before either Brain or Nerves are so perfectly form'd, as that the Animal Spirits can be elaborated out
of

of the Blood by the one, or transmitted to the Heart by the other: And since they are made out of the arterial Blood, *that* must be sent to the Brain, by the Pulsation of the Heart, before *they* can be generated. Besides, those muscular Motions, that depend upon the Influx of the animal Spirits, are *voluntary*, which *this* of the Heart is *not*; for we can neither *retard* nor *help* its Motion *at our Pleasure*. And the Hearts of young Animals (Puppies and Eels in particular) being cut out of the Body, and *from* all the Nerves by which the Animal Spirits might flow, will (*however*) not *cease* to beat, so long as they are warm; yet when they do *cease*, if warm Water be poured upon them, they will recover *some sort* of Pulsation; which also contradicts the *second* Opinion (*viz.*) that its Motion depends on the Rarification and Dilatation of the Blood: For if it depended wholly on that, it would *cease* as soon as the Blood *ceases* to flow into its Ventricles: And, to *confirm this*, let us remember an Observation communicated to Dr. *Lower* by a Physician of good Credit, (*viz.*) “ Of a Youth
“ of sixteen Years of Age, who continuing Bleed-
“ ing for two Days together, his Friends or-
“ der’d him good Store of Broth to keep up
“ and recruit his Spirits, which swallowing down
“ greedily, his Bleeding was thereby increased;
“ so that at last, having poured forth almost the
“ whole Mass of his Blood, that which now came
“ out was *diluted* and *pale*, neither of the Na-
“ ture nor Colour of Blood, but more like to
“ the Broth he had drank so plentifully of: And
“ this Kind of Flux continued a Day or two,
“ the Heart, all the Time, continuing its Pul-
“ sation, till at last (the Hemorrhage being stopp’d)
“ he

“ he was by degrees restored to Health, and liv-
 “ ed to be a strong, lusty Man.

So that had the Motion of the Heart depend-
 ed upon the Accension and Dilatation of the
 Blood, *then*, when the Broth flowed into the Ven-
 tricles, its *Motion* must have been either much
alter'd, or have totally *ceas'd*, the Broth being
 so very different from the Nature of the Blood.

And that its Motion does not depend on *both*
 the foremention'd Causes, in *Conjunction*, may be
 concluded from what has been said to each of
 them *apart*: And we shall not take upon us to
 determine what is the *real Cause* of its Motion,
 after so many Men of better Parts and Learn-
 ing have been so unsuccessful in their Attempts
this Way; but leave the Secret with him that made
 it at first, by his Almighty *Fiat*, and who *alone*
 perfectly knows not only its wonderful *Mecha-*
nism, but its Secrets also; we only know, to our
 Sorrow and Shame, every one for himself, *That*
the Heart is deceitful above all Things, and despe-
ately wicked, Jer. 17. 9. And the wisest of *meer Men*
 has told us, Prov. 28. 26. that he *that trusts in it*
is a Fool.

At its *Basis* are two *Auricles*, or Ears, one on
 each Side: The *Vena cava* opens into the *right*
Auricle, and the *Vena pulmonalis* into the *left*; the
first discharges the Blood it receives from the *Cava*,
 into the *right Ventricle*; and the second obtrudes
 the Blood that comes from the the *Vena pulmona-*
lis into the *left*. Their Substance is compos'd of
 two Orders of Fibres, which terminate in a Ten-
 don at the *Basis* of the Heart; and at the right
 Auricle is a Circle, like a Tendon, where the *Ca-*
va ends.

Their Use is, to receive the Blood which is
 brought from the *Cava* and *Vena pulmonalis*, and
 by

by them to be thrust into the Ventricles of the Heart.

The *Ventricles* also are two, answering to the *Auricles*, one on each Side, separated by the *Septum Medium*. The Vessels which enter and come out of the Heart, are the *Vena cava*, the *Arteria*, and *Vena pulmonalis*, and the *Aorta*, or *Arteria magna*.

The *right Ventricle* receives the Blood from the *Cava*, thro' the *right Auricle*; and at the Mouth of this Ventricle are placed three Valves of a triangular Form, called, *Tricuspides*; which three Valves form a concave Cone, that hinders the Return of the Blood to the *Auricle*; and it is therefore thrust out at the *Arteria pulmonalis*, which rises immediately out of the *right Ventricle*: Its Mouth is less than the *Cava*, and has three Valves, call'd *Smegmoidales*, which, when they separate, give Passage to the Blood from the Ventricle into the Artery; but they shut the Passage, if the Blood offers to return.

The *Arteria pulmonalis* carries the Blood to the *Vena pulmonalis*, which discharges itself thro' the *left Auricle* into the *Ventricle* of the same Side. At the Entrance of this Ventricle are two Valves, from their Form called *Mitrales*; having the same Use as the *Tricuspides*, placed on the other Side, and just now mentioned.

The *Aorta* rises immediately out of the *left Ventricle*, and has three Valves, of the same Use with the others already nam'd.

The Arteries of the Heart are two, called *Coronaria*, because their Trunks (not presently entering the *Parenchima* of the Heart) take a Circuit on its Surface, in order to branch themselves towards its Cone, and encompass its *Basis*, like a *Crown*.

It has also two Veins of the *same Denomination*, because they encompass the Heart, in the *same Manner*: They *receive* and *carry back* the arterial Blood from the Heart, after *sufficient* is spent on its Nutrition, and return it to the *Cava*, near its Entrance into the right Ventricle.

Of the Lungs, and of Respiration.

THEY hang loose in the Cavity of the *Thorax*, being suspended by the *aspera Arteria*, whose Branches run every where thro' their Substance, and is itself sustain'd by its Connection to the Parts of the Neck.

By the *Mediastinum* they are divided into two Lobes, and the left Lobe is often subdivided; their Colour, in a *Fetus*, is of a pale Red, but when the Air once enters 'em, they are always pale, tho' with some Difference. They are fasten'd to the *Sternum*, by the *Mediastinum* before; and to the *Vertebra* by the *Pleura* behind, and sometimes to the *Pleura*, where it covers the Ribs.

The Lobes are cover'd with a double Coat, and their Substance is a Composition of prodigious Numbers of little Lobes of diverse Figures, with small vesicular Cells: They are disposed like so many Bunches of Grapes on the Side of the *Bronchi*, and each little Lobe contains, within its own Membrane, an Infinity of little round Vesicles; into the Cavity of which the Extremities of the Branches of the *aspera Arteria* open.

The Vessels which enter the Lungs are the *aspera Arteria*, and the *Arteria pulmonalis*, from the

the *right Ventricle*; and the *Vena pulmonalis*, whose Trunk opens into the *left Ventricle* of the Heart. Both these divide into Ramifications, for the two great Lobes, and there again are subdivided into as many Branches as there are little *Vesiculæ* in the Lungs; and whenever there is here a Branch of the *Vein* or *Artery*, a Branch of the *Trachea* is always between them.

Upon the *Bronchi* (which are the Branches of the *Trachea Arteria*) run the *Arteria bronchialis*, and the *Vena Pneumonica*; the Artery springs from the *Aorta*, and the Vein from the *Subclavian*. On the *Bronchi* also run the fine Fibres of the eight Pair of Nerves, or *Par vagum*. The Lungs have also *Lymphaducts*, which empty themselves into the thoracick Duct.

The Action of the Lungs is *Respiration*, which is an alternative Dilatation and Contraction of the Breast, whereby the Air is received in, and driven forth of the Lungs.

Now the Lungs, for want of Muscles, have no Power of their own to dilate themselves; nor have they any magnetick Quality to attract the Air. And tho' Contraction is the proper Office of a Muscle, and altho' the Lungs have none, yet the Muscles of the *Thorax* are so framed, that the *Thorax* is dilated by certain of them, and contracted by others: And in the Time of its Dilatation, the Lungs have Time to expand, and also the Air, by the Pressure of the *Atmosphere*, and its own Elasticity, forces its Way into the *Trachea*, and into all its *Bronchia*, and so into the *Vesiculæ*, and fills them.

But in *Expiration*, the Air is driven forth by the Compression of the *Thorax*, and Contraction of the vesicular Fibres, of the *Vesiculæ*, and inner Coat of the *Trachea*, and its *Bronchia*.

Ingenious Men have laid down many Uses of *Respiration*, according to their *different Thoughts*, the *principal* of which are these. (1.) It serves for cooling the Blood, which acquires a great Heat in the right Ventricle of the Heart. (2.) For the better Mixture of the Particles of the Blood, as it passes the Lungs. (3.) For condensing the Blood (which was very much rarified in the right Ventricle of the Heart) and so it takes up less Room in the Lungs, and becomes capable of being received into the left Ventricle. (4.) By the Distention of the Lungs, in *Inspiration*, the Vessels are *compress'd*, and the Blood thereby squeezed out of the Arteries into the Veins, and so its Circulation thro' the Lungs is promoted; whereas it would be apt to *stagnate*, and occasion a Suffocation, if it was otherwise. (5.) The Blood, by the Mixture of the *Nitro-aereal* Particles of the Air, is fermented, and freed from *Coagulation*: And the same *Nitro-aereal* Particles being receiv'd into the Blood, are carried to the Brain, for the *Refectiō* and Supply of *Animal Spirits*. (6.) Hereby the Air is drawn in, for the greater *Subtilization* of the Blood, and for *accending* and *continuing* the *vital Flame*. It is of Use also to *modify* the Voice, and minister to the Sense of *Smelling*.

Of the LIVER.

Its Structure and Office.

IT is seated at about a Finger's Breadth Distance from under the *Diaphragma*, in the right *Hypochondre*, under the short Ribs, a little below the *Cartilago Ensiformis*. Its upper Part is *convex*, and its lower *concave*. It is cover'd with a very thin Membrane, which, if at any time separated by a waterish Humour, issuing out of the capillary Lymphaticks, waterish Pustules are form'd; and if they break, their Water falls into the Cavity of the Belly, and produceth an *Ascites*, or Dropsy of the Belly.

And tho' its *Parenchima* looks red, yet that proceeds only from the great Quantity of Blood, poured into it from the *Porta*; for its proper Colour is a *paleish Yellow*; and yet, even that *Yellowness* seems to be owing to the *Bile* passing thro' it, and so gives it that *Tincture*: So that *Malpighius* thinks White to be its proper Colour; and says, *lib. de Hepate*, c. 2, 3, 5. that it is compos'd of innumerable *Lobules*, each of which has six Sides, and consist of many *Glands*, like to the Stones of Raisins, and are each of them cloath'd with a proper Membrane. And that the Branches of the *Porta Cava*, and *Porus Biliaris*, run thro' all the Globules in equal Numbers. The Branches of the *Porta* doing the Office of Arteries, and which, with the Branches of the *Porus Biliaris*, are tied together in the same common Cover.

In its upper Part the *Vena cava* enters, and spreads itself quite thro' it; and in its lower Side

the *Porta* is inserted, whose Branches run thro' its whole *Parenchima*, which has but very little Sense, because its Nerves extend *only* to its Membranes and Vessels.

Its Office is, to separate the *Bile* from the Blood; which is brought in great Plenty to it from the *Porta*, full of *Bile*, for Secretion, by the Glands; and the Branches of the *Cava* carry back the Blood (that remains) to the Heart.

It has *Lymphaducts*, most of which open into the *conglobate* Glands, near the *Porta*, on the *concave* Side; and from thence the *Lympha* is carried by other *Lymphaducts* to the *Receptaculum Chyli*.

Of the SPLEEN.

Its Mechanism and Use.

IT is placed in the left *Hypocondrium*; its upper Part is tied to the *Diaphragma*, its lower to the left Kidney, by its hollow Part to the upper Part of the *Omentum*, and to the *Stomach* by divers Vessels.

In new born Infants it is *Red*, but in grown Persons it is *blackish*, or of a *Lead Colour*. It is composed of an infinite Number of Membranes, which form little Cells full of Glands, of different Magnitude and Figures, which are always full of Blood, and communicate one with another.

We are told that its Use is not to be a Receptacle of the *atra Bilis*, an Humour no where to be found, but in the Fancies of the Antients; but to make a *subacid* and saltish Juice of the arterial Blood and animal Spirits, which flow in Plenty to it, and which, passing by the *Ramus Splenicus* to the Liver, assist there, to make and help forward the Separation of the *Bile*, after this Manner, (*viz.*) The Arterial Blood being poured out from the Capillaries, into the Glands or Cells of the Spleen, and mix'd with some Animal Spirits, deposited there by the Ends of the Nerves, which curbing the Sulphureous Spirit of the Blood, induce on it a *little Acidity*; and then being driven out again by the Pulsation of the Arteries, and Pressure of the adjacent Parts, it is receiv'd into the Roots of the *Splenick Vein*, and so into the large *venous Duct*, from whence it flows into the *Ramus Splenicus*, and by it is convey'd to the *Vena Porta* and Liver: But it makes some Stay in the Cells and Glands of the Spleen, that it may acquire more *Acidity*, as Wine does, the longer it is kept in a Vinegar Vessel.

That the Spleen contributes to the Action of the Liver, may be gather'd from hence, That the Blood takes so long a March from *one* to the *other*, by the *Ramus Splenicus*; whereas it might readily have been conveyed into the Trunk of the *Cava*, which is near the Spleen, if the Juice that is elaborated in it, had not been for the Assistance of the Liver.

Dr. Keil says, That the *Bile* is composed of many Particles, which slowly unite, and that, by Reason of the Nearness of the Heart to the Liver, and of the Blood's swift Motion thro' the *Aorta*, these Particles could not unite in so small a Time, and with such a great Celerity of the Blood, if the Blood had not been brought into the Coats of the

the Stomach, Omentum, and Guts, by the Branches of the *Porta* to the Liver: But *because* all these Parts were not sufficient to receive all the Blood necessary to be sent to the Liver, *therefore* the Spleen was formed, into whose Cavities the Blood being poured from a small Artery, moves as slowly as any that passeth otherwise to the Liver: By which the Particles that compose the Bile in the Blood, which passes thro' the *Ramus Splenicus*, by such a long and slow Circulation, have more Chances for uniting, than otherwise they would have had, if they had been carried by the Branches of the *Celiac Artery* directly to the Liver. And *therefore*, without the Spleen, such a Quantity of Bile, as Nature requires, could not have been secreted by the Liver. And this, he says, is the true Use of the Spleen.

Whether an Animal may live, that has the Spleen cut out (as some have reported) we shall not here stand to dispute. But surely a Part, so hard to come at, and that has large Vessels inserted into it, cannot, with any Safety, be taken out; Wounds of it being commonly mortal, and even Inflammations and Obstructions *there*, grievously afflict, and sometimes kill the Patient. But could it be really taken out, and not kill the Patient, yet he must thereby become very diseased; the Bile (for want of the subacid Juice from this Viscus) would not be perfectly and uniformly made, nor duly secreted from the Blood in the Liver, which, in some time, would bring a general Diffcrasy upon all the Fluids, which would destroy the Patient.

By Particles of the Blood, which slowly unite, and of the Liver, which is so small a Part, and with such a great Colony of the Blood, if the Food had not been brought into the Veins of the

Of the Pancreas, and Succus Pancreaticus.

IT is a conglomerate Gland, seated between the Bottom of the Stomach, and the *Vertebra* of the Loins, reaching from the Liver to the Spleen. It is joined to the *Duodenum*, *Rami Splenici*, *Omentum*, upper *Plexus* of the *Abdomen*, and sometimes to the *Porus Biliarius*, but not to the Spleen itself. Every one of its Glands has an *excretory Duct*, which uniting altogether, form one common *Duct*, of the Bigness of a Goose-Quill. It runs all along the Middle of the *Pancreas*, and opens into the lower End of the *Duodenum*, or Beginning of the *Jejunum*, and has a little *Caruncle* at its Orifice. Sometimes it joins the *Ductus Cholidocus communis*, and both make but one Mouth into the Intestine.

Within Side the *Pancreas*, it is divided into two Branches, that send forth a Multitude of *Ramifications* into all its *Globuli*, where they imbibe the Humour that is separated by them from the Arteries, and by the common *Duct* send it to the Intestines.

It has Veins, Arteries, Nerves, and Lymphatics. The Use of the *Succus Pancreaticus* is to dilute the *Cbile* with the Liquor that is separated in the Glands of the Intestines, that it may with the greater Facility enter the Lacteals, and so assist Sanguification.

Diemerbroeck says, That in the Dissection of Brutes, both alive and newly strangled, he found a certain Liquor, *sublimpid* and, as it were, *salivous*, (something austere, and lightly *subacid*, and having

ing sometimes something of Saltiness mix'd) to flow out of the *Ductus Pancreaticus* into the *Duodenum*, sometimes in a pretty Quantity; and from thence concludes, that there is excocted in the *Pancreas*, a peculiar Humour from the serous and saltish Part of the arterial Blood brought into it, having some few animal Spirits, (convey'd thither by small Nerves) mix'd with it; and that this Liquor flowing into the *Duodenum*, and there presently mix'd with the Bile, and the Meat concocted in the Stomach gliding by the *Pylorus* into the Guts, does cause a peculiar *Effervescency* in those Aliments, whereby the *profitable* Chylous Particles, separated from the *unprofitable*, are attenuated, and being brought to greater *Fusion*, are withal made apt to be impell'd by the peristaltick Motion of the Guts, through their inner mucous Coat, into the Lacteals; and the unprofitable Parts, by little and little passing down to the thick Guts, is there kept till the Time of Excretion.

Now this *Effervescency*, he says, is caus'd thro' the volatile Salt and *sulphureous* Oil of the *Bile*, meeting with the Acidity of the Pancreatick Juice; as in Chymistry, we observe the like *Effervescencies* to be caus'd by the Concourse of Things.

Besides which he quotes an Experiment of *de Graef*, who in live Dissections could sometimes gather an Ounce of it, in seven or eight Hours time, which he has tasted and found to be *Austere*, *Subacid*, and *Saltish*. *Vide ejus Anatom. Corp. Humani*, pag. 73. &c.

From all which, and much more that might be said, we may gather, that the Pancreatick Juice is not *meerly* excrementitious, but a *necessary Fluid*, of excellent Use to dilute the *Chyle*, and assist Sanguification, &c.

Of the BILE.

Its Use, and Manner of Secretion.

IT is a bitter yellow Liquor, separated in the Liver, collected in the *Vesica Fellis*, or Gall-Bladder, and discharg'd into the lower End of the *Duodenum*, or the Beginning of the *Jejunum*, by the *Ductus Hepaticus*, and according to *Diemerbroocke*, is thus form'd, (*viz.*)

“ The Blood flowing into the Liver by the
 “ *Porta*, out of the *Gastrick* and *Mesaraick* Veins,
 “ (and it may be a little by the *Hepatick Arter-*
 “ *ry*) is mix'd with an acrimonious, saltish, and
 “ subacid Juice, (made, in the Spleen, of the Ar-
 “ terious Blood flowing thither by the Arteries,
 “ and of the Animal Spirits, by the Nerves)
 “ which is brought into the *Porta* by the *Ramus*
 “ *Splenicus*. Now both these being enter'd the Li-
 “ ver, by the Branches of the *Porta*, by means
 “ of this said acrimonious and acid Juice, and the
 “ *Cottion* of the Liver, the spirituous Particles,
 “ both sulphureous and salt, lying hid in the said
 “ venous Blood, are dissolved, attenuated, and
 “ become also a little acrimonious, and ferment-
 “ ing: a certain (thinnest) Part whereof, like clear
 “ Water, being separated from the other thicker
 “ Mass of the Blood, by means of the conglo-
 “ bated Glands, plac'd mostly in the concave Side
 “ of the Liver, is carried from thence by many
 “ *Lymphaducts*. But the fermentaceous Spirits
 “ of greater Acrimony, mix'd with the thicker
 “ and

“ and more viscid sulphureous Juices, (for Sulphur
 “ is viscid) and more strongly boiling ; when as
 “ thro’ the Clamminess of the Juices in which they
 “ inhere, they cannot enter the conglobated
 “ Glands, nor from them the Lymphaducts ; and
 “ yet, thro’ their fierce Ebullition, are separated
 “ from the Blood, (as Yest from Beer) ; these fer-
 “ mentaceous Spirits, I say, being severed with
 “ the Juice, in which they inhere, become *bitter*,
 “ and are called *Bile* ; which *Bile* being transco-
 “ lated thro’ the Grape-stone-like Glands, into
 “ the Roots of the *Porus Biliaris*, and of the Gall-
 “ Bladder, passes thro’ them by the *Ductus com-*
 “ *munis* into the *Duodenum* or *Jejunum*, where it
 “ is presently mix’d with the Pancreatick Juice,
 “ and both of them with the alimentary Mass,
 “ (concocted in the Stomach, and now passing
 “ down this Way) which it causes to ferment.
 “ And because, at its first Entrance, it is more
 “ acrimonious, and has its Virtue entire, and so
 “ causes the greatest Ebullition with the Pan-
 “ creatick Juice ; hence the milky Juice, con-
 “ tain’d in the Mass concocted in the Stomach,
 “ is most readily, and in the greatest Quantity, se-
 “ parated in the *Jejunum*, and by innumerable
 “ Lacteals (which are more numerous in this than
 “ in the other Guts) it is most quickly driven on
 “ towards the *Receptaculum Chyli* : And this is the
 “ Reason that this Gut is always so empty. But
 “ in the following Guts, because the fermenta-
 “ taceous Spirits are a little pull’d, the Efferve-
 “ scence becomes slower and less efficacious, and
 “ the *Chyle* more slowly separated from the thicker
 “ Mass, and therefore they have fewer *Vena Lactea*.
 “ At length, what is left of this fermenting Matter,
 “ is mix’d with the thick *Feces* in the thick Guts,
 “ where, by its Acrimony, it irritates them to
 “ Excretion. *vid. Diemerbr. p. 154.*

Borellus believes, that the *Bile* has a constant Circulation; and affirms, that in a Days time there passes from a Person fasting, thirty four Pounds of Bilious Juice into the *Duodenum*, by the common *Duct*; whereas the whole Quantity of *Bile* does not amount to above two Pounds: And denies that so great a Quantity of *Bile* can be produc'd by Fermentation in the Liver, but says it is mechanically separated, without the Assistance of any Ferment, only by *Cribration*, from the small Vessels of the *Porta* thro' the Pores of the *Hepatick Glands*, as the Urine is strained thro' the Kidneys; and that there is a Circulation of the *Bile* thro' the *Abdomen*, perform'd by the *Vena Mesaraica*, into the Trunk of the *Porta*, thence to the Liver, and so thro' the bilious Vessels to the *Duodenum*, to return again by the *Mesaraic Veins*.

But whether the Separation of the *Bile* be merely by *Collature*, or that the Fermentation first mention'd is also necessary, is not of very great Moment; but that it is done in the Liver, and by Percolation also, is very certain; and as the Liver does not *sanguify*, (altho' believ'd to do so by the Antients) yet it must be to some excellent Purpose that so large a *viscus* is created; and as there is none yet found, but this of separating the *Bile*, we cannot but think that the *Bile* is a *Fluid* of absolute Use to the Well-being of the Creature, and very necessary to the Life of the Animal; especially if we consider, that whenever the Liver is wounded, or diseased, the Surgeons or Physicians Art is too often baffled, and in spite of all Endeavours, the Patient commonly languishes and dies.

The Gall Bladder is fix'd to the Concave Side of the Liver, and the *Bile* is brought into it by some small Vessels that arise from neighbouring Glands,

Glands, which uniting, form one or two Pipes, which open at the Neck of the Gall-Bladder.

• From the Neck of this Bladder goes a *Tube*, about the Bigness of a Goose Quill, call'd *Ductus Cysticus*, whose inner Membrane has several *Rugæ*, to hinder the too rapid Motion of the *Bile*; and to this *Tube* is join'd another, call'd *Ductus Hepaticus*, or *Porus Biliaris*; and these two together make the *Ductus Choledocus Communis*, which goes, obliquely, to the lower End of the *Duodenum*, or beginning of the *Jejunum*; but it runs about two Fingers Breadth between the Coats of the Intestine, before it opens into its Cavity, which hinders the *Bile* from returning into the *Ductus communis*, when it has once enter'd the Intestine.

In the *Meatus* of the *Vesicula Fellea* we find no Valves; for with a slight Compression of the Finger, the *Bile* will fluctuate to and again out of the *Cystis* into the *Meatus*, and the contrary, as also out of the *Meatus* into the *Ductus Communis*, and back again.

The Use of the *Bile* is to blunt the Acidities of the *Chyle*, because they being entangled with its Sulphurs, thicken it so, as that they cannot be sufficiently diluted by the Pancreatick Juice, so as to enter the Lacteals.

By *Analysis*, it yields more of a *lixivious* than of a *volatile, alkaline Salt*; and it has been observed, that of the great Quantity of *acid Salts*, found in the Aliment in the Stomach, none could ever be found in the *Chyle*, after it had passed the *Duodenum*; and because *Chyle* is almost continually passing thro' the *Duodenum*, it is requisite also that the *Bile* should be perpetually pour'd into it from the *Ductus Hepaticus*; and as the Stomach is more or less distended with Aliment, it squeezes out of the Gall-Bladder a proportionate Quantity of *Bile*, to be incorporated with the *Chyle* in the Intestines.

The

The *Bile* is in an healthful Person *Yellow*, but in a degenerate State of Health, it is sometimes *Pale*, *Eruginous*, *Blackish*, *Perraceous*, &c.

The *Jaundice* is caus'd either from want of a convenient Ferment, to separate the *Bile* from the Blood, or when the Neck of the *Gall-Bladder* is so obstructed, that the *Bile* cannot pass out of it ; and then the *Gall-Bladder* is so fill'd as that it can hold no more, and the *Bile* being compell'd to stagnate in its Roots, is receiv'd in, by the Branches of the *Cava*, and thereby tinctures the whole Mass of Blood *Yellow*.

Silvius de le Boe thinks, that the Colour in the *Jaundice* proceeds from *Choler*, too plentifully confus'd with the Blood, which, he says, is evident from the natural Colour of the *Choler*, and the pale Colour of the Stools ; and that *Choler* in the *Jaundice* seems not to be increased in Sharpness, because neither Pain nor Pricking is felt in any Part of the Body, unless when it begins to be cured ; but rather that it is most intirely mix'd with the Humours it meets with both in the small Guts and Blood, or right Ventricle of the Heart, and that so, as it is impossible to be separated from them again ; which is perform'd by an Effervescency with an acid Humour in both Places, meeting with an *alcalious* or *lixivious* Humour ; and that *Bile* helps on this Effervescency, by vertue of its *lixivious* Salt, but very much allay'd, to make the Effervescency friendly to Nature ; which Allay proceeds from the Oiliness and Fatness of *Bile*, as also by means of its volatile Spirit, which tempers it, and causes it to mix with other Humours ; and he thinks that the *Jaundice* may be bred without a Stoppage of the Passage in the small-Guts by the *Bile* being made too spirituous or volatile, and therefore unfit

to make an Effervescency, being not embodied, but confused with the Blood.

But there are some others, who dissent both from what *we* and *Silvius* both have said with respect to the Jaundice, and tell you that they follow *Paracelsus*, who denies, that the Gall gives the yellow Tincture; but that the Colour arises from the Mixture of the Salts, according to their Kinds. They call our Doctrine, the *Galenick Pathology*, and deny any Separation of *Bile* from the Blood in the Liver, and say, that it is perpetually generated in the Gall-Bladder itself, of lymphatick Juice, or viscous, sweet Water, separated from the Blood in the Liver, and sent into the Gall-Bladder by proper Strainers; and that all the Fluids contained in their proper Receptacles, act, each of them, as a Ferment; and by their own proper Power convert the sanguineous Serosities each into its own Nature. So the aqueous Juice of the Blood, being strain'd into the salival Glands, becomes *Spittle*; into the mammary Glands, it becomes *Milk*, into the conglobated Glands, *Lympha*; into the *Pancreas*, *acid Flegm*; into the Reins, *Urine*; and into the Gall-Bladder, *Bile*; all which, say they, it does by the proper Ferment of each Part.

And that the Lacteals receive only so much pure *Chile*, and that only mixed with so much *Bile* as serves the Intentions of Nature; and that the *Chile* is neither colour'd yellow in the Lacteals, nor bitter to the Taste, altho' it is both yellow and bitter in the *Jejunum*.

Others say, That the true Cause of the Jaundice is from the volatilizing or subliming, Part of the animal Salt of Man's Body, which may be done, (1.) From violent Fevers. (2.) From violent Exercise. (3.) From excessive Drinking of strong Liquors. (4.) From the enraged Bite of venomous Beasts. (5.) By the Power of Poison, by which the univer-
sal

sal Habit becomes inflamed, the Spirits agitated, and the volatile, saline Principle removed out of its Place, into all the exterior Parts, and from them would fly away; but meeting and mixing with the cool, viscous Juice of the *Cutis*, it is there stopt, and being dissolv'd, it excites that yellow Colour; which is very easy, because the animal Salt, being distributed with the Blood, thro' the whole Body (as well superficial as internal) and this (*they say*) is the Reason that *sometimes* this Disease shall spread all over the Body in a few Hours, it being the Nature of all animal Salts to sublime and fly away; and that even without Heat too, if they be dissolved and freed from a thick, compacted Matter.

And as to the Colour of the Skin, it is the Nature of most Salts upon their Mixture with other fit Bodies, to excite or stir up new Appearances of Colours, according to the Nature of the particular Salt. Thus a Solution of Vitriol, mixed with an Infusion of Galls, immediately excites an *opacous Black*. A Tincture of Cochineel, mix'd with *Aqua Calcis*, or *Sac. Saturni*, makes a *fine Purple*: A Mixture of the Tincture of red Roses, and Oil, or Salt of Tartar, gives a *curious Green*: Allum dissolv'd in a Decoction of Brasil, Ebony, or Madder, makes a *glorious Red*: A Solution of Salt of Tartar in Spring-water, mix'd with a Solution of corrosive Sublimate in Water (altho' both Solutions, single, are as clear as Chrystal) will, in a Moment, make a *reddish Yellow*, or *Orange Tawney*: And *Spi. Nitri* will change the Cork that stops the Bottle, into a *perfect Yellow*.

And with *Armoniack*, or animal Salts, dissolved in proper *Liquors*, many Colours may be made to appear, either black, green, tawney, purple, yellow, &c. From whence a Possibility is inferr'd, that a *fit Salt*, seizing upon, and being dissolv'd

by the *cutaneous* Juice, may produce the Jaundice, Purple Spots in Fevers, *Livid* ones in the Plague, and also may be the Cause of many other sudden Changes in the human Frame: And according to the Nature of the cutaneous Juice, at that time encountering with the animal Salts, or according to the Contamination of *that Salt*, so is the Colour in the Skin, producing what we call a yellow, black, and sometimes the green Jaundice.

And that the Jaundice does proceed from a Diminution, or Decay of the animal Salt in Man's Body, seems to appear from hence, (*viz.*) because Goose, and some other Dung, *Millepedes*, Lice, and such Things, abounding with animal Salts, cure that Disease, by increasing and restoring the animal Salt in our Bodies; the white Part of the said Dung being *only* of Use; that *alone* containing the animal Salt of the Creature from whom it comes, the chaffy, or black, terrene Part being of no Use at all in Medicine, &c.

But these Things we shall leave to be discuss'd by Men of Leisure and Curiosity; and shall not determine for any Body but ourselves; but believe that every Man of Ingenuity will be capable to make a right Judgment of these different *Theories* from what has been said.

Of SPECIFICKS.

A Specifick is a Medicine which cures some particular Disease, at *all Times*, in *all Ages*, and Degrees, if not absolutely incurable, in its own Nature, either by reason of Age, Corruption,

tion, or Decay, in some noble Part, or of a Complication of some mortal Disease.

Specificks, are found, by Experience, to have respect to one Part more than another; consisting of such Particles as being near of Kin, (and consequently associate easily) to the Recrements, to be strain'd out by a particular *Viscus*, are carry'd thither (as it were electively) together with them, and there perform their Operation; which Similitude is not in the Fluids only, but there seem to be an Organical Kindred in the Solids also; whereby a Medicinè may strike an Impression, particularly upon one Part, and not upon another. Thus Dr. *Grew* tell us, that *white Hellebore* affects the Lips *most*, *Coloquintida* the middle of the Tongue; deadly *Nightshade* the Roof of the Mouth, and *Fallap* Root, the Throat, &c.

And tho' the fashionable Opinion of late runs, that there is no such Thing in Nature as elective Purgation, and that no cathartick respects one Humour more than another; yet irrefragable Experience proves to the very Senses, that *Gambogia* (for Example) draws off (more especially and) *specifically*, watery Humours; yea, so watery, that sometimes the Stooles are very little tinged; and therefore in an *Anasarca* (where the Bowels are Sound) one would bless himself to see how much Good they do, as also, in *OEdematous* Tumours, and running Ulcers. *Fuller.*

In Opposition to this *Hypothesis*, Dr. *Quincy* would establish the contrary, and laughs at this *Specifick* Doctrine: It has been (says he) a prevailing Notion, that there is some specifick or elective Quality in Catharticks, by which some are suited to draw off, and expel such particular Humours, and will not meddle with, nor affect any other; and upon this Notion it is, that they are so constantly distinguish'd in Physical Writers,

by peculiar Names, expressive of their respective Properties; hence such a Thing is call'd a *Chologogue*, or Purger of Choler; this a *Hydragogue*, or Purger of Water; and another, a *Phlegmagogue*, or Purger of Phlegm; but our *Theory* will not admit of any such Conclusion, because no Medicine under this Denomination, how efficacious and surprising soever in its Operation, can act but *mechanically*, according to those Laws of Motion which all other Bodies are subject to; and therefore, when the Discharges by Stool discover an Over-Proportion of any particular Humours, the Purge, to whose Efficacy it is ascrib'd, is not to be suppos'd to have done it by any such Election, but that there was either a Redundance of such an Humour, whose Discharge any common Irritation would occasion, or that there was some peculiar Aptitude from the Figures and Bulks of the Medicine, to deterge those Parts where they were lodg'd, and set them in *Fusion*. Thus, in Proportion to the Proximity of some Humours, to the intestinal Tube, and the Disposition of the Passages, to convey them that Way, do they require greater or lesser *Vibrations*, or Shakes, of the *Fibres*, from a Cathartick, to fetch them out. For this Reason the brisker Catharticks, which vellicate the Membranes most of all, pump out, as it were. from all the *Mesenterial* Glands and neighbouring Parts their Contents; which because they abound so much with *Lymphaticks*, and viscid watery Humours, make the Discharges thin and watery; those which act in somewhat a lower Degree yet irritate enough to deterge, and draw out a great deal of *Mucus* and viscid Matter, which sometimes by Lodgment, and want of due Motion, changing into various Colours, occasions different Names, of Phlegm, or Choler; as the former therefore pass for *Hydragogues*, so do the latter for

Purgers

Purgers of Phlegm and Choler ; and the organical and constituent Parts being incapable of receiving any Help from Medicines, but by the circulating Mass, and the Blood only being passive in its Circulation, hath no Power to lodge a Medicine, more in one Part than another, to help it when diseas'd, &c.

I must confess that I have a very great Deference for what Dr. Quincy says in most Cases, but in this I cannot but dissent from him ; and, indeed, if the Manner of the Operation of a Cathartick is according to the peculiar Aptitude of the Figures and Bulks of Medicine, &c. as he readily grants it is ; we then only differ about Words, since from the *Modus* of its Operation, we call that a Specifick, which he from the same *Modus* of Operation, will needs call by another Name, to justify his own Theory : What is the *Bark*, but a Specifick in *Intermittents* ? What is Mercury, but a Specifick in the *Lues* ? Why does Turpentine and Asparagus, impress such plain, tho' different Characters on the Urine, any more than any other natural Balsam or Vegetable ? Why do Balsamicks and Volatiles so suddenly and effectually assist the Lungs, more than any other Medicines, but that they do it specifically, and as it were electively ? And indeed what the Doctor says concerning *Vulneraries* may be a sufficient Answer to him concerning Specificks : *Vulneraries* (says he) are a Sort of Balsamicks, which are not only softening and adhesive, but also by a peculiar Activity, or Disposition to Motion, joyn'd with a suitable Configuration of Parts, are apt to abrade, and carry along with them such Particles as they lay hold of in their Passage. All Medicines of this Intention, are suppos'd both to cleanse and heal, that is, to *incarne*, or fill up with new Flesh, all Ulcerations, &c. both internal and external ; now
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to do this (in all internal Cases especially) the Medicine must be suppos'd to maintain its primary Properties, until it arrives at the Place of Action, and there it does what intitles it to this Appellation, by its adhesive (*which I call Specifick Quality,*) which consists in its comparative Largeness of Surface, and Fluxibility of its component Parts, &c.

And of Restoratives he says, they are rather nutritive than medicinal, and are more administered to repair the Wastes of the Constitution, than to alter, and rectify its Disorders: Now whatsoever can answer this End, must be both indued with a Disposition, to enter *into*, and mix *with* the most subtile of the animal Fluids, and so fall *into* and adhere *with* such Interstices of the Solids, as have been wore away by Action, and stand in Need of Recruit.

Which is, in plain *English*, to say, they do it specifically, and perform that, &c. in that Manner, that no other Thing, but such as they, or of their own Tribe, ever can do, and which is all that is contended for. The great *Boyle* wrote a Treatise, of the Agreeableness of Specifick Remedies, with the Corpuscular Philosophy.

Of the BARK.

The Modus of its Operation explain'd.

DOCTOR Quincy says that this celebrated Drug is made up of Parts very solid, irregular, and pointed: Its Contexture, upon its breaking to Pieces, appears like little *Cylinders*, or *Needles*, shooting one over another, pretty like some Sort of Salts
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in their Chrifallization; and where it is broken tranfverfly, thofe Points are very vifible, and they continue fo, even in pounding, as far as the Eye can follow them.

The Difficulty of reducing it to an impalpable Powder, and the little Alteration it undergoes by long Infufion, and its manifefl Aftringency on the Tongue, are fufficient Proofs of its Solidity and Angular Figure. But befides the groffer Parts, which are not without great Difficulty broken into fmaller, it hath alfo, in its Compofition, fome very minute Particles, which eafily diffipate, as appears, both from its penetrating Bitternefs on the Palate, and that which riles and flies off in pounding. From this Difcovery then of the Texture of this wonderful Simple, we may eafily apprehend, how it is fo effectual in the Cure of Agues; and that is, (1.) fometimes to deftroy thofe Vifcidities in the Juices, which obftruct the Capillaries and fmall Veffels. And (2.) to invigorate the Vibrations of the Solids, and to draw them up to fuch a Tenfity; as may prevent the Generation of new Matter. Now, by the Smalhnels, Solidity, and Irregularity of its Particles, when mix'd with the Blood, it cannot, but immediately increafe the Occurfions and Impulfes of its Parts, one againft another; whereby many Cohéfions will be broke, and the Occafion of fuch Cohéfions prevented for the future; that is, the Blood will become more *Fluid*, and lefs *Vifcid*, and then Digestion, and a proper Comminution of the Juices, will be better perform'd, by its corrugating the Nerves, and making the Contractions of the Veffels more vigorous.

That the Bark is efficacious, in contracting the Fibres and in giving greater Stability to the Solids, is farther confirm'd, by its Effects upon fuch

such as are subject to sweat profusely; which it as certainly cures as it does Agues, and that by straitening the Fibres, hardening the Muscles, and so enabling them to break and digest the Fluids, far enough to throw off that Overcharge by insensible Transpiration, which before went off by Sweat. And this drawing up of the Solids is perform'd by the Bark's corrugating and astringing the Fibres, wherever it touches them, from its *Entrance* into the Stomach to its *Exit* out of the Body.

That it acts as a *Stimulus*, both upon the Stomach and Intestines, is too plain to be deny'd, if we consider how often it irritates them to discharge their Contents, and goes off as a Char-tick (but then it loses much of its Efficacy on other Accounts); also its putting by, or curing a Fit by one large Dose only, taken about an Hour before its Attack, is a farther Evidence, that it effects *that*, only by drawing up the Solids into a straiter Tone, and by preventing the Eruption of the obstructed morbid Matter, and preventing its coming into Action.

Now, if it acts thus efficaciously, as an Astringent in the *Primæ Viæ*, where a natural *Mucus* guards the Fibres, and in great Plenty cleaves to them, it must needs act with much more Force, in the same Manner, upon the Solids, when it is brought into much smaller Vessels, as it passes into the Blood, and when it comes there also; for where a Particle of it in the Stomach strikes against a *Fibre* once, it is like to do it a thousand Times; when it comes into one of the Capillaries; for which Reason, when the Blood comes to be pretty well loaded with the Particles of the Medicine, the *Fibres*, in all Parts, will be corrugated and shortned at once; whereby the whole human

man System will acquire such a Strength and Firmness, as will enable it, not only to keep off the Attacks of the morbidick Matter, but expel it as an Enemy out of the whole Body; and from hence we may learn how serviceable it is in Hemorrhages and Fluxes of divers Sorts, too many here to enumerate.

Medicines that cure Diseases without Evacuation (as the *Cortex* doth) their Effects, or Operations, must be bounded to one of the common Fluids, (*viz.*) either the Blood or Spirits, and cannot *immediately* reach to any of the appropriate Juices, by reason such Juices are only Separations of such Parts of the Blood, as will pass the secretory Vessels: And such Parts having pass'd them, may be discharged, but cannot be altered by the Blood, from whence alone they are derived.

Its main Efficacy consists in detaining the Blood from falling into Disorders; and little or no Virtue is derived from it, unless rightly applied.

Altho' the *Cortex* is properly fitted to cure *periodical* Disorders in the Blood, yet it will not *always* perform *that*; for whenever intermitting Commotions of the Blood are excited from some Cause *without* the Blood (as in Hectick Fevers, &c.) the *Cortex* is ineffectual; which, altho' they are usually occasioned by some putrid Matter contained in the Lungs, yet commonly they appear more violent at one time than another. And so of Disorders that seem to be originally deriv'd from the Spirits; for the circulatory Motion of the Blood depending upon the *Vibration* of the Heart, and the Heart being mov'd by the Spirits, the Motion of the Blood will be alter'd and disturb'd by the Spirits; and these sometimes falling into periodical Disorders, the Motions of the Blood become perplexed. And this Commotion,
altho'

altho' periodical, yet not being begun by the Blood, will not be remov'd by the Bark.

Altho' it is accused by some, as being the Cause of grievous *Mesenterick* Obstructions, yet it will produce no such Effect, if the Body be rightly prepared, and it be administred by a skilful Hand. Nay, Dr. Morton (*de Morbis acutis*, p. 139.) says, *Cortex in Puerperio salubriter ministratur, i. e. The Bark is a good Medicine for Child-bed Women*; but our common Practice does not justify it.

When it is boil'd in Glisters for the Cure of Intermittents, it often cures (especially in Children) if rightly administred. The Way is, to give it presently after the Paroxysm; and as soon as it comes away, to give another, and repeat it so often, that the Intestines may be continually imbued with it, from Fit to Fit, till the Fever be gone; and after that, repeat it six Days Morning and Evening; and for six Days more, one in the Evening only. An Ounce of the fine Powder, boiled in Water to a Pint, and strain'd thro' a coarse Sieve, is a fit Proportion for a Man; and if the Patient cannot retain it long enough, add to each Glister an Ounce of *Diacodium*.

If in taking it by the Mouth, a *Diarrhea* happens, add to it Powder of *Balaustines*; and to the Evening and Morning Doses *Laud. liq. gutt. 15* or *20, &c.*

It is always best in its pure, natural Dress, and never mended by any Chymical Process; it not being probable, that its Specifick Efficacy (which necessarily flows from a peculiar Texture of its minute Parts) should be improv'd by Chymistry, which would only change its Texture, and alter its internal Constitution; for Powers and Qualities of Substances, arising from the internal Constitution of their minute Parts, it follows, that if we destroy or alter the Texture from

from whence the Powers proceed, the Powers themselves must be alter'd likewise.

And that the chimically Analizeing of Substances does *this*, is evident, in that the Parts, into which they are by this Art resolved, bear no Resemblance to the Whole: For as the Alteration of the Texture of a Substance brings a manifest Change in the Qualities, so a Change in the Qualities prove, an Alteration in the Texture: For if Substances differ from one another only in the Size, Figure, Motion, Rest, Order, and Position of their minute Parts, and their Powers and sensible Qualities proceed from them, then it is plain, if the first are alter'd, the second must be chang'd: And that this, in Fact, is so, clearly appears from chymical Preparations, where the Nature, Qualities, or Powers of such particular Bodies, as are thus *analized*, are often changed and lost, and new ones acquir'd, extremely differing from the former, as may be notoriously experienc'd in most of the elaborate chymical Preparations; in most, or in many, of which the sensible Qualities of Medicines; are not only alter'd, but also their Powers, Effects, and Operations, which they should have had upon our Bodies, are chang'd; some Things, perhaps, becoming thereby *Emeticks*, or *Catharticks*, that were by Nature neither, or perhaps are chang'd from such, to *Diaphoreticks*, *Alteratives*, &c. And this Consideration makes it certain, that no real *Specifick* can be better'd in any of its native Virtues, by any elaborate Preparation whatsoever, by reason such Virtues, depending upon some peculiar Modification of Parts, which, by tearing and dividing the Texture of the Substance, in order to resolve it into what the Chymists call their *Principles*, must necessarily be changed; there appear-
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ing in a Multitude of their Preparations no more Remains of the native Properties of the Substance, than there does in Vegetables of the Earth and Water, out of which they are nourish'd.

A long *Coction* is absolutely necessary to extract the *whole* Virtue of it ; for if you boil it *eight* times, yet the *very last* Boiling will have a manifest Bitterness and Roughness, and but very little chang'd in Colour, nor much wasted in Weight, and will be still effectual, (tho' not quite so much as at first) either in Decoction or Powder. But it ought from the first to be reduc'd to a most subtil Powder, or the whole Virtue will not be extracted.

If it be given by Form of Electuary (and that there is no Fear of a *Diarrhœa*) if a little fresh Butter be added to it, it will be the easier swallowed, and also sit better upon the Stomach.

In making of its Tincture or Extract, if a due Quantity of Spirit of Sulphur *per Campanum* be added, it will partake of the Essence of the *Cortex* more abundantly. The Proportion of it in the Tincture, may be two Ounces of the Spirit of Sulphur, twelve Ounces of Spirit of Wine, and four Ounces of the *Cortex* in subtil Powder ; and the same Quantity may be put to half a Pound of the Powder of the Bark, with six Pints of other proper Liquids, in making the Extract.

Sometimes Intermittents will not obey it ; and when that happens, it has been found, that a Decoction of Camomil Flowers, and Salt of Wormwood, have done the Work as well, if continued three or four Times a Day for some time.

Before you give the *Cortex*, an Emetick ought to be given to clear the first Passages, which will both secure the Patient from any Hurt, by taking it, and render its Effects more certain ; give it

it so as it may have ended its Operation just at the Time that you expect the Paroxism: For if it be given in the Fit, there is Danger of translating the morbifick Matter from the inferior Parts to the Head, and so cause a *Delirium* or Madness.

Sometimes the Bark being given alone, without any warm Assistants with it, such as, *Rad. Serpentar. Virgin. Zedoar. Contayerv. &c.* the Ague returns again: For the more, Perspiration is promoted, the less liable a Patient is to such an Unhappiness; for the Reason why the Fit returns after such a certain Time, when put away by the Bark *only*, is, for want of thrusting out some of the peccant Humours by such warm Things as *these*, join'd with the Bark; for Want of which the said Humours are only pent up from Action for a time, and so break loose again, as soon as the Restraint is over.

It contains some volatile Salts, a great deal of Oil, and but little Acid; and therefore it is a fit Remedy to suck up those Acids that congeal the Blood, and render it more thin; and by that Means is put into a Condition to exonerate it self from noxious Humours; but if it be given without precedent Evacuation, a little to diminish the Quantity of the Blood, the Vessels are apt to be over distended, and to pour out the *Serum* of the dissolv'd Blood upon the Parts, and so bring on a Dropsy.

Tauvry says, That the Bark dissolves the Blood, which he proves from *hence*; that if you mix Blood with its Infusion, it will not congeal; and if it be congealed, it will return to its liquid State. *This may be worth the Tryal.*

If it be given by way of *Bolus*, it frequently stays in the Stomach, and does not so well mix with the Blood, but weakens the Stomach, spoils
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its Ferment, and destroys the first Concoction, which may somewhat be help'd, by mixing with it some fixed Salt.

Of ALTERATIVES.

AN Alterative is a Medicine that, without any Evacuation, causes some Change or Alteration in the Blood and Humours; and how this is perform'd, may be easily conceiv'd, by having Recourse to that Section which treats of the Blood, &c. to which I refer my Reader.

Silvius says, that mild Alteratives are used to much more Advantage, just *before, at, or after* Meals, than at any other times; for so the virtue of the Medicine kindly mingles *with*, and insinuates itself *into*, not only the *Saliva* in the Stomach, but also all the Humours that flow together into the Right Ventricle of the Heart, and all the Arteries and Veins; and by *that Means* the Emendation and Correction of them is the sooner and more easily and happily perform'd, &c.

But it is to be minded, that most Alterative Medicines operate by Fermentation, and so put the offending Humour into Motion; wherefore, lest the Symptoms should by that Means be augmented, it will be convenient (especially in chronical Distempers) to give them in moderate Doses, and continue them a good while, encreasing the Dose *gradatim*: And by this Method sometimes Chronick Distempers are happily cur'd, without any Evacuation at all; but then it is by

proper

proper Doses, and assiduous taking, which every wise Physician will quickly find out and accomplish.

And here I shall take Leave to transcribe from Dr. Quincey's *Dispensatory* some Lines (as I think) very much to the Purpose, where, speaking of the Virtues of the *Panacea Antimonii* pag. 270. he says thus, "Almost all the foregoing Preparations of Antimony, how severe soever alone, may be so managed, in a skillful Hand, as to operate little, or not at all in the *Primæ Viæ*, nor be perceiv'd, until they are got into the smallest Vessels; and then it is, that those mighty Things are to be effected, which cure the Gout, Pox, Evil, and all those Diseases, which are too much the *opprobria Medicorum*; and it certainly is the Want only of this Knack, of converting the most efficacious Catharticks into Alteratives, that makes the common Practice, in chronick Cases, so little to the Purpose: There are, at this Time, in the Hands of some Empiricks, Medicines upon this Basis, which are too much a Shame to Learning and Education; but how can it be otherwise, when Practice is calculated, rather for the Ease and Dispatch of a great deal of Business, than to cure Patients; whereby Cases of Difficulty are not worth the Cure of any, but Quacks, and such as venture at Random."

And truly the Thing is too true, to be deny'd; for it cannot but be acknowledg'd, that as chronick Diseases require a long Time for their Cure, so also a Set of Medicines, which, if given without being alter'd from their first Principles, would one Way or other be pernicious; the Change that may be made this Way is seen in nothing more, than in Mercurial Preparations, where such a Simple as Quicksilver is, which, of itself, is of no observable Efficacy, (I having known a Per-

son, for what is call'd *The Cholick of Poickers*, or *dry Belly-Ach*, in the *West Indies*, have about a Pound of it in his Body for fourteen Days together, before it pass'd through him, without any Manner of Operation) I say, such an innocent Thing as that is, *in itself*, for a Man to take into his Body, *without Harm*, in such a great Quantity; and yet a few Grains of *Mercurius Sublimatus*, which is made of Quicksilver, to prove so deadly to any one, that shall but dare to take it; and then this poisonous Preparation *again*, to be converted into such a *benign* and safe Cathartick, as *Mercurius Dulcis* and *Calomelanos*, is very well worth our Notice, and shews the Good to Mankind that would accrue, if Physicians *dipp'd* more into this Study.

Where the Vessels are stuff'd with Viscidities, *Alteratives* make Way for *Catharticks*, by melting, breaking, and deterging the Humours in the small Vessels, and fitting them for their proper Outlets, which a *Cathartick* alone could not effect; but when an *Alterative* has fused the Humours, and caused them to flow, then a proper Purge will, by mixing with the Blood, easily carry them off: But there is a Way, could it be hit upon, to convert *Catharticks* into *Alteratives*, and then it is that they do their Business most effectually, in all chronick Cases *especially*.

Sometimes the whole Mass of Blood and Humours are overrun with *exotick* Ferments, and equally tinctur'd with them, so that we should sooner kill than cure the Patient by Evacuation only, as in the *Scurvy*, *Rheumatism*, and in many other Diseases; wherefore, *proper Alteratives*, that are capable to encounter these Ferments, and assist Nature to alter the *Crisis* of the Blood and Juices, may be successfully given, without any Danger to the Patient; and no Evacuation at all
need

need be made, *so as to weaken him*, but only now and then a proper *Cathartick*, to carry off that Load of foreign Matter, which the *Alteratives* have either separated from the Blood, or render'd fit for Evacuation.

In the *Rheumatism*, particularly, I can, and frequently in my Practice do, give a certain Medicine, which so encounters the Disease, and assists Nature, that with purging once, or twice, at most, and bleeding but once, and sometimes neither of them, the Patient, though he cannot stand, nor feed himself, and though used to lie by it for twelve or sixteen Weeks together, yet shall be able, in a Week, ten Days, or a Fortnight at most, and sometimes in less Time, to go about his Business, the Swellings of his Joints and Pain, being all gone clean off; or, if it sometimes happens, that the Tumours do not go *immediately* away, yet the Pain shall vanish, and the Patient be in Ease, and all this by the Power of *Alteratives*, and without any Mercurial Preparation whatsoever; and the Medicine to be taken is but the Quantity of two Spoonfuls twice a-Day.

Of MERCURY.

Its Operation explained.

IT is a *metallick Liquor*, or crude imperfect Metal, or rather a Substance that resembles Metal: There is contain'd in it a subtile and volatile *Earth*, and a metallick *Water*, which makes its *Fluid*; and a *Spirit*, which is its proper Mercury.

It is a *Volatile*, and the least Fire makes it evaporate : It is likewise *opacous*, because it has strait Pores, and such as never can be otherwise dispos'd, without changing its Nature, being compos'd of *spherical* Particles, that are in perpetual Motion.

It is a great Enemy both to the Brain and Nerves, if taken too much *crude*, or ill prepar'd.

It is ponderous, because it contains much *Salt*, as all Liquors are that abound with it; and altho' we can by *no Art* gain its Salt, no more than we can get it from some other Metals; neither can we extract Salt from Glass, altho' *we know* that there is a great deal of *Sal Kali* in it.

It resolves Humours, and dissolves Flegm, *because* it is penetrating, and compos'd of an *acid Salt*, and a *Sulphur*, which are very proper Dissolvents; because Flegm contains much of an *Acid*, wrapt up in *unctuous Matter*; and Tumours proceed from Flegm *made hard and thick* by an *Acid*, and therefore Mercury dissolves it.

Sometimes Mercury *only* purges; and it is believ'd, that in such a Case, it meets with some *Alkali*, which makes it let go those *Acids*, and precipitates the Mercury into the lower Parts.

It's doubtful, whether any *lixivial Salt* ought to be prescrib'd with *Mercurius Dulcis*, because *Sublimate* (of which *Dulcis* is made) is Mercury coagulated with an *Acid*: Now, if the *lixivial Salt* breaks the *Acid*, perhaps the *Compost* may be dissolv'd, and the Mercury let loose thereby.

Mercury, mixing with the Blood, attracts its *acid Salts*, when they abound there; and, uniting to them, carries them off, either by Stool, Spittle, &c. This Power, by which Mercury attracts *Acids* and *sharp Salts*, is the Reason why *Cinnabar* is so effectual a Medicine in the *Rheumatism*; for the Urine in rheumatick Persons is found, upon
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Examination, *not* to contain its due Quantity of Salts, which *therefore* being retain'd in the Blood, turn *acid*, and produce *those Pains*.

The Fluidity of Mercury is easily conceiv'd of, from the *Sphericity* of its Parts, which makes them so readily roll over one another; and its *Gravity*, from the Solidity of those Parts, containing so much Matter, out of Proportion to their Surface. Now, to find out how it comes to pass, that a Body, *so very heavy*, should sooner rise by Fire, than those that are lighter, we are to understand, that upon the Division of solid *Spheres*, their Gravities decrease in a *triplicate* Proportion of their *Diameters*; but the *Superficies* only in a *duplicate*: So that a Body, circumstanc'd as Mercury is, if it be divisible into very small Parts, may be render'd *specifically* lighter than Air it self, and then will it rise in Air, by the known Laws of *Gravitation*.

Because therefore the *Sphericity* of Mercurial Particles gives them less Contact with one another, and that by the Force of so minute and active an Agent as Fire, its *Globules* are to be broken, almost into an infinite Number of more *Globules*, their specifick Gravities will be soon render'd so much less, than those of Air, that they cannot but fly upward, in *imperceptible* Vapour; when other Bodies, *specifically* lighter, in larger *Coalescencies*, because they are not so divisible, and their Figures admit not of such a Decrease of Substance, so much faster than their Surfaces, as those of Mercury do, cannot be render'd so much *specifically* lighter, and *therefore* they cannot so soon rise in Vapour.

Now to conceive how Mercury, in its native Dress, should be so very innocent, and yet in *Sublimate* become a Poison; and *that* again, when made into *Mercurius Dulcis*, be a very safe *benign*

Medicine, we must consider, that in making the *Sublimate*, the mercurial *Globuli* are stuck full of sharp Salts, from the *Aqua Fortis* with which it is prepar'd ; so that each Particle of the Mercury is like a Ball, arm'd with sharp Needles, whereby, the *Fluidity* of the Mercury is lost, and of a *smooth*, acquires an *unequal* Surface,, whereby they will no longer slide over one another, but become fix'd ; and thus the Salt, being drove into the mercurial *Globules*, gives them Points which they had not before ; and the mercurial *Globules* add to the saline Particles a Gravity which they before wanted ; and so the Mercury, when *crude*, in Circulation in the Juices, altho' it would strike hard upon what it met with, yet, for Want of Angles, could not vellicate the Parts ; and the saline Parts, altho' they had Points, had not Force enough, by themselves, to drive them into the Membranes, so as to do much Harm ; but, when they are join'd together, and made a *Sublimate* of, the Weight of the Mercury drives in the *Spiculæ*, like a *Wedge*, and makes them cut, and tear to Pieces, whatever lies in their Way, and occasions Gripes, Distentions of the Belly, slimy Froth by Vomit, bloody Stools, intolerable Heat, and Thirst, cold Sweats, Convulsions, and Death itself ; and thus these armed Balls, like Daggers, wound the Coats of the Stomach, and all the Parts they pass through, wear off the *Mucus*, tear off the Extremities of the Vessels ; and, if they get into the Capillaries in Circulation, they must stick there, and stop the Blood, whereby the Part will inflame, and mortify ; and this is the Way, that corrosive *Sublimate* is so very mischievous.

And now, *on the contrary*, let us enquire, how it is divested of its Poison, and again made a *salubrious* Medicine, by repeated Sublimations with

live

live Mercury, as appears in *Calomelanos*: In order to this, we are to consider, that the Action of these saline *Spiculæ*, depending upon their Magnitude and Gravities, they are, by every Sublimation, broken into smaller Parts, whereby those little Daggers, that were before so sharp, must needs be near lost, so as not to be made capable to make Wounds deep enough to be deadly, nor mischievous; and therefore will only twitch the sensible Membranes of the Stomach, so as to excite them to an Excretion of their Contents, and glandular Juices, upwards or downwards, as the Force of the Irritation is greater or less.

And then the mercurial *Globules*, being free'd from most of their saline Parts, as they pass thro' the *Primæ Viæ*, yet still, having a Mixture of some few of them, are quickly convey'd into the Blood, where, by their Motion and Weight, they necessarily dissolve the preternatural Cohesions of all the Fluids, particularly of those that circulate in the smallest Canals, and are more viscid and tenacious, making them more fluxile, and of more easy Secretion; *whereupon* all the Glands of the Body are set to work, and clear'd of their Contents, especially the salival ones, being many, large, and wide, and their Juice ropy and viscid.

From hence we may infer, that the safest Way of raising a Salivation, is by giving this Medicine *internally*; because the mineral Globules, being intimately combin'd with Salts, and the several Preparations given inwardly, will, by the Irritation of *these*, be easily and fully thrown out, at the Organs of Secretion, till the Blood is quite discharg'd of its Load; whereas, in the Use of mercurial Ointments, we can never be certain, that *none* of the heavy Particles are left lodg'd in the Intestines, or Fibres, of the Cells of the Bones.

*Of Salivation by Mercury; its Nature
explain'd.*

BUT also, inasmuch as by computing the Proportion of Mercury, in all the Doses necessary to promote a Spitting, and the Weight of the same Mineral usually apply'd, when this is done by Unction, it will appear, that the Quantity in the latter Case, greatly exceeds that in the former; and so the Inconveniencies will be proportionably the same.

Besides, if at the Time of Unction, the Pores are too much shut, but a very small Quantity of Mercury enters; which, for that Reason, not being capable to dissolve the Flegm, which is all over the Body, a venereal Ferment is left behind, and a Pox (in all likelihood) soon breaks out again; and, if the Pores are too open, a great deal of Mercury enters at once, which attenuates the Flegm with too much Precipitation, and hinders an equal Distribution of the Mercury through the Body, and the Resolution of the coagulated Humours, and so endangers a Suffocation.

And altho' taken inwardly, yet, if the Blood is over-power'd by the Quantity of the Mercury, and thereby render'd *unable* to purge, and dispermate itself, by the *salival Glands*, or any other Passages, it swells and expands in its own Vessels, by which Means its Circulation becomes *gradually* hinder'd, and, *at length*, *suppress'd*, and *then the Patient dies*; and yet, if administer'd in *too small* a Proportion, it does not disorder the Blood enough to cause it to *dispermate* itself, and so it signifies *nothing at all*.

Nature voids the excrementitious Matter, that remains after the first Digestion, with the more gross Parts of the *Bile* and pancreatick Juice, by *Stool*; and the superfluous Serosity, (after it has serv'd as a Vehicle for the nutritive Juice, with which all the Parts of the Body are nourish'd) partly by the Veins, and partly by *insensible* Transpiration; and so of the other Excrements, by particular Passages; and lastly, as to the *Pituit*, or Flegm, the salival Glands are appointed for its Evacuation.

The *Pituit* and *Saliva* are the same, as to Matter, and only differ in Consistence; for the *Saliva* is the first Matter of the *Pituit*. The *Saliva* is continually swallow'd down, and when it is in the Stomach, it grows thick, and, in the Digestion mixes itself with the most viscous Part of the *Aliment*, and is afterwards carry'd into the *Duodenum*, where it mixes itself continually with the *Bile* and pancreatick Juice, which makes a Sort of Fermentation; by Means of which, the gross Parts are precipitated, or forced downwards, to be evacuated by *Stool*; and the purer Part is carry'd by the *Venæ Lactææ* to the *Receptaculum Chyli*, and so to the Heart, and from thence, by the Arteries, to all the Body, with the Blood; from whence it is gradually separated, by the conglomerated Glands, that lie on either Side the *Mandibulum*, and from thence it is carry'd, by the salivary Conduits, to the Mouth; in which the *Pituit*, that descends from the Brain, does mix with it, there being a considerable Quantity thereof produc'd in the Head, by Reason of the Coldness of that Part; which *Pituit* does insensibly pass through the *Infundibulum*, from whence it is filter'd thro' the pituitary Glands into the Mouth; so that it is easy to comprehend, how the Flegm is carry'd from all Parts of the Body into the Mouth, and that

that by its natural Motion; and *therefore*, in a Salivation excited by Mercury, the Flegm being put into a quicker Motion than ordinary, does easily draw to itself all the Impurities of the Blood, and *especially the venereal Ferment*, because of its *Acidity*, and, by that Means, the Blood is completely purify'd.

When Mercury has once enter'd the Body, the Heat reduces it into Vapour; and tho' mix'd with acid Salts in its Preparation, it still retains its round Figure, so that it is more easily carried to the Brain; when, by Reason of the Cold that it meets with there, and because it joins itself more readily to the *Pituit* than to any other Humour, upon account of the Acids which it contains, and the salivary Vessels do always abound with *Flegm*, that is, Matter of the *Saliva*, the Mercury dissolves the same; and for that Reason it is more abundantly evacuated by the salivary Ducts; and seeing the Flegm does extract the Mercury, the Extremities of the salivary Vessels are corroded; likewise the Glands of the Throat and Mouth *thereby* are ulcerated, whence it is, that the Salivation is increased, and a great Quantity of Flegm issues out of the Mouth, till the same has washed the Ulcers dry, *and then the Salivation ceases*.

Now, altho' by Salivation the Blood *disputates* itself by a Flux, thro' the salival Glands, yet the Advantages receiv'd by that Evacuation are not owing *wholly* to a *Specifick* Vertue in the Mercury, but *also* to the long Continuance and Proportion of it. For the Mercury *only* puts the Blood into this Condition of purging itself, if given in a just Quantity; but if *overdone*, is so far from assisting it to disputate itself, that it will destroy Life, and become Poison. *A great deal, or too much of it, entering the pituitary Vessels at once, makes the Pituit, and the rest of the Humours, ascend too fast*

fast to the Throat and Head, and produces Inflammations, and other sad Accidents, if not skilfully prevented.

And altho' we have here affirmed, that Mercury has a great deal of *acid Salt*, yet we are to know, that notwithstanding this, it may sometimes (and does) operate like an *Alkali*, but upon a quite different Reason; which is, *because* its Salt is fetter'd by a great deal of *Sulphur*.

And why, when the Blood has purify'd itself, it should *only* cast forth its Filth and Dispumation by the Glands of the Mouth, and not discharge Part of its own Substance *also*, is owing to the particular Texture of the Globules of the Blood, and to the Figure of the Orifices of those Glands, which never admit of any bloody Discharge, unless *overdone* with Mercury.

Now, altho' it is true, that we here affirm, that Mercury contains a great deal of *acid Salt*, yet it profligates the venereal Virulency, which is of an acid, corrosive Nature. This may easily be conceiv'd of, if we consider, not only what is above hinted, (*viz.*) that its acid Salt is fetter'd by much Sulphur, but also, that the pocky *Virus* is a *peculiar Acid*, differing from all others. And as there are several Kinds of Acids, such as are opposite, and even destructive to one another, differing from each other in Form, Quantity, Quality, and Manner of Operation, as Oil of Vitriol, Sulphur, Nitre, *Aqua fortis*, *Aqua Regis*, &c. So the Mercury, tho' partaking of an acid Salt, yet being of a quite different Nature from the acid, pocky *Virus*, may encounter, overcome, and destroy it, and so act as an *Alkali*; and this we say, to prevent unhandsome Reflexions on what we here advance, (relating to Mercury) from some Men that abound in their own Sense, and are ready to quarrel with every thing that does not (tho' but

but in Appearance) square with their own Notions.

And now to return to our Discourse concerning Salivation. If it does not come on fast enough, or that it decays before the Symptoms vanish, it must be excited anew by Mercurials; and if it goes on orderly, it is to be increased gradually, till the Patient spits four, five, or (in a gross Body) six Pints in a Day and Night, drinking in that time as many Pints of Posset-drink, &c.

If the Spitting rise too high, it is to be repress'd, (1.) With Catharticks. (2.) With Incrasfatives, or Thickners, as Opiates, &c. because they so thicken the Matter *at once*, as to hinder its flowing to the salival Glands. (3.) With *Sulphurines*, because they have Power to fix the most volatile Spirits; as Mercury is fixed into Cinnabar, *only* by subliming it from Sulphur. (4.) With Gargarisms, that are absterfve, drying, and healing.

If Spitting of Blood happens to the Sick, add to the *Sulphurines Terra Japonica, Laudana, &c.*

Every time, before eating and drinking, during a Salivation, cause the Patient to gargle and wash his Mouth and Throat two or three times together with warm Water, to carry off *that Filth*, which would otherwise, by swallowing, be carried down into the Bowels and Stomach, and *thereby* the Patient would feed upon his own Poison, and so renew the Disease. And for *this Reason* it is, that *sometimes* the Patient misses of a Cure, and is obliged to salivate two or three times over *without Effect*. Besides, in doing of this, it prevents those *terrible* Ulcers in the Throat, Tongue, and Gums, with falling out of the Teeth, Flux of the Bowels, &c. which commonly happen, if this Caution be not taken,

If

If the Salivation comes on gently, it ought not to be purged off, nor any Diet-drinks given, till it has had its Course; yet if it rises too high, and there is Fear of Suffocation, Catharticks must be given even in the Middle of it.

Sydenham says, " That till towards the Close of the Salivation, the same Rules are to be observed, as in Purging, (*viz.*) to keep within the Chamber, guard against Cold, and eat moderately of such Food as is good, and easy of Digestion, and not to be confin'd to the Bed. For (says he) from the contrary Methods it is, that when Nature has been totally oppress'd with so great Affliction, the Spirits exhausted, and the Body deprived of all manner of Strength, thro' Sweating, Purging, and unnecessary Fasting, many Persons have miserably perish'd; and very often, when the Disease is vanquished, the Patient being destitute of that Stock of Spirits and Strength which are requisite for a perfect Recovery, does then, thro' pure *Weakness*, yield to his Fate. I am of Opinion therefore, says he, and Experience is for me, that besides Gruel, Panada, Posset-Drink, and warm Ale, we may (nay we ought) to allow the Patient Veal, Pullets, and the like, to be eaten moderately, as soon as the Tumor of the Gums is fallen, so as he can make Use of his Teeth, and that he may keep his Bed, or rise, at Pleasure. For since the Disease is cured by Salivation, and not by Diaphoreticks, I cannot imagine why the Patient should be tormented with too much Heat, without any Necessity. This Method, as it is more expeditious, seeing it does not impose upon the Patient a long Preparation of the Body before Salivation, nor solemn Purges, nor Decoctions, nor Diet-Drinks after Salivation, so I am very well assured,

“ assured, that it is much more easy, and less dan-
 “ gerous, and does not so much expose the Pati-
 “ ent to a Relapse. And not to say any thing
 “ of Bleeding, which some believe to be the prin-
 “ cipal Thing in this Case, if we have a due
 “ Regard for Truth, seeing this Disease is to be
 “ cured with Salivation, .by mercurial Prepara-
 “ tions, and without which Operation the Pa-
 “ tient cannot be safe, and securely made well;
 “ the Question is, Whether it is best to perform
 “ it whilst the Body is strong and vigorous, and
 “ so able to grapple with its Enemy, and stand
 “ the Shock of all the Violence offer’d in this
 “ Work of Salivating, or after it is weaken’d by
 “ Phlebotomy and a spare Diet ? He that weighs
 “ the Thing impartially, will undoubtedly con-
 “ clude, that it is better to do nothing at all in
 “ this Case, than to expose the Patient to Mis-
 “ chief by *such tampering*. And Experience teaches
 “ us, that they who are not thus weaken’d by such
 “ an Evacuation, or by any other Means, do
 “ much better endure the Fatigue of Salivation,
 “ than when they are beforehand enervated (as
 “ it were) by such improper Methods.”

It is then to be noted, that there ought to be
 no Purges, nor Diet-Drinks, exhibited, till after
 the Salivation is over, unless we are forc’d to it
 by reason of an *Atrophy*, or Fear of Suffocation :
 Nor is there need of Purging to carry off the Mer-
 cury ; for either it does not operate at all, and
 then it goes off as the *Excreta* ; or if it works by
 Salivation, or a *Diarrhœa*, it carries itself off with-
 out any Assistance. And Diet-drinks are not *al-*
ways absolutely necessary to the exterminating of
 the *Virus*, because that is eradicated by the Mer-
 cury, whether by Salivation, or given singly, and
 purg’d off, &c.

Yet

Yet Purging may be used with Mercurials, (1.) When we design a Cure by Catharticks. (2.) When a Mercurial is given beforehand, in order to purge it off, and prevent its salivating. (3.) After salivating, to carry off the gross Recrements of the Intestines, and other *Viscera*, which could not be discharg'd by Spitting.

And Diet-drinks may be given when the Salivation is perfectly over, to restore the *Crafs* of the Blood and Juices, to absorb any preternatural Acidity latent in the Blood, and to expel any morbid, cutaneous *Feculency*, yet lodged in the external Parts, and not easily remov'd by Salivation.

If the Patients cannot take Diet-drinks of *Guaicum*, &c. a Tincture of *Gum Guaici*, made in *S.V.* and given three times a Day, may, in some Cases, be substituted in its Place.

Sometimes, instead of Salivating, the Mercury precipitates downwards; but this does not always hinder the Mercury from penetrating into all the Parts, and is better than when it terminates in Sweating; and this is caus'd from the abundance of *alkalious Salts*, which meeting with the Mercury, stops its Motion, and forces it downwards; and here is Room for proper Catharticks and Diureticks.

At other Times it operates by Urine; and this is accounted better than by Stool, and happens in such Bodies where *acid* and *alkalious Salts* are near equally predominant; for Acids taken inwardly become diuretick, but joining with the Mercury, they may be sublimed or carried upwards with Heat, *whereby* they lose that Property, unless encounter'd with a sufficient Power of an *alkalious Salt*; for then being dissolv'd in the *Serum* by the Power of the *Alkali*, the Mercury is precipitated *downwards*; and by Virtue of the
Acid,

Acid it is conducted to the Reins, and so the Impurities are carry'd off *that Way*.

Sal Viperar. à gr. x. and other animal volatile Salts, in double that Proportion, taken for a long Time, are very efficacious, if used *with*, or *instead of*, the common Diet-drinks, at due Intervals.

Also daily Bathing in warm Water, which softens, loosens, and opens the Pores, and causes a Perspiration of that Matter outwards, which could by *no Art* be drain'd away by Salivation; and which dilutes and sweetens the cutaneous Juices, and so clears the Surface from the Remainder of the Disease.

Lean, thin, Bodies should not be drain'd too much by Salivation, lest we consume the *Humidum Radicale*.

Salivation by Fumigation, as practis'd of old, has been attended with Danger; but of late Years, like all other Things, *this Way* has been very much improv'd. The Way now is, the Patient is dress'd in his Cloaths as usual, and in the Morning put into a little close Room like a Closet, and the following Troches put upon live Coals in that little Room, and he receives the Fumigation up his Mouth and Nostrils for about an Hour (more or less) as he is able; and when over, he goes about his Chamber and House as usual, only taking care of Cold.

The Troches are these :

R. Cinnab. artificial. ʒjss. Pulv. Benzoin. Mastich. Mirrh. Oliban. ana ʒss. Cort. Winteran. & Rad. Zedoar. ana ʒij Thuris ʒss. Tereb. q. s. Fiat Troch. N^o. xl. for Ten Fumigations.

This causes the Patient to spit immediately to an Hour, or more, and a little all the Day after

ter till the next Morning, but so as not to be minded by others; and then it is to be repeated again, as before; and this is to be done for thirty or forty Days, till he becomes well.

This Method, if carefully followed, is not full of Danger; and if the Weather is warm, he may go abroad (when the Spitting is over) every Day, as usual.

Nor need he observe any *over-strict* Rules of Living, as to Eating or Drinking, only he is to forbear all salt and sour Things.

Contumacious Symptoms in any particular Part afflicted with Rheumatick or fixed Pains, malignant Herpes, *Phagedenick* or *Cacoethick* Ulcers, that yield to no other Method, are often happily cured by Fumigation, by laying *that* Limb in a proper Posture, covering it hollow over with Blankets, and putting some of these Troches upon *live* Coals under it; yet it is *not without its Danger*, and ought to be cautiously used.

If after the Use of Mercury, we find that any of its Particles stick in the solid Parts, and the Patient is injur'd thereby, *alkalious, volatile* Spirits and Salts are of the greatest Use, as *Sp. Sal. Armon. Sp. & Sal Urinæ, &c.* given for a long time; also *Rad. Enulæ & Feniculi*, infus'd in Wine, and drank *ad lib.* *fs.* Morning and Evening, warm, and sweating after it. When the Mercury does not enter the Blood, it often causes a Tumor, with Pain and Danger. In that Case foment it daily with warm Milk, and then with *Aqua Calcis* ʒiiij *S. V.* ʒij *Troch. alb. Rhaf.* ʒss *misce.* If the Mercury leaves a Swelling in the Head, bath it with a strong *Lixivium*, and keep the Part warm, &c.

Of O P I U M.

Its Operation explained.

IT is reported of *Silvius*, that he said, *he had rather be no Physician, than not understand the Use of Opium.*

(I.) *Opium is highly impregnated with volatile Salts*, which appears (1.) By its biting, pungent Taste. (2.) By its rank and vehement Smell, which is common to volatile Salts alone, or joyn'd with some Oily Parts, like the Smell of *Semen Virile*, which (in Smell,) *Opium* is most like. (3.) From its ready Dissolution in Water, which must be from its volatile Salt, because it has but thirty two Parts of the fix'd Salt in the Mass. (4.) By its Dissolution in Spirit of Wine. (5.) By its inciding and dissolving Quality when externally apply'd. (6.) Because of its resolving Quality; and this is the Reason why all Narcotick Plants, as *Solanum Lethale*, *Hemlock*, *Henbane*, &c. that are saturated with volatile Salts, are such great Resolvers of hard Tumors. (7.) By its Exulcerating, or Blistering Quality. (8.) By its offending the Eyes. (9.) By its being a *Psilotrick*. (10.) By its titillating Quality. (11.) By its Aptitude to fly away. (12.) If it be set to cristallize, after it is evaporated, so to do, it affords a great Quantity of volatile Salt.

(II.) *It is very Sulphureous*; and this appears. (1.) By its Inflammability. (2.) Because it will soften in a dry Warmth. (3.) Because it is bitter; for Oleose Particles (as both *Silvius* and *Dr. Grew* affirm) are always one Ingredient of a bitter Taste. (4.) Its tawny Colour argues much Sulphur. (3.) By *Autopsy*, upon its chymical Analysis. (III.)

(III.) It has a sort of *resinous Sulphur*, that is loose and not united with its volatile Salt, which is evident, (1.) From its Dissolution in Water, where a good Quantity of Rosin will lie undissolv'd at the Bottom, and subsides without Trouble. whilst the volatile Salt is, for the most part, dissolved in the Water, and separated from the resinous Part. (2.) If Opium be dissolv'd in *S. V.* it imbibes the Rosin, which is very easily (again) precipitated with Water, which leaves most of the volatile Salt behind it, in the Form of a *red Tincture*, which Tincture has all the Vertue, Smell, and Taste that is worth any thing; for the resinous Part has no Effect (or very little) as an Opiate, but has many ill Qualities, and therefore to be rejected.

(IV.) That this red Tincture does possess *most*, if not *all*, the volatile Salt of the Opium, is demonstrable from hence, (1.) The *specifick Bitterness* which proceeds from volatile Salt, and oily Parts, is wholly in that *red Tincture*. (2.) That Tincture reduced to an Extract, has the biting Taste of Opium, and the Vertues also. (3.) After Evaporation, and being set in a cool Place, it will shoot into elegant Chrystals.

(V.) This *red Tincture* is *oleose* also. For (1.) Pure, volatile Salt *alone* gives no Tincture; but the Redness proceeds from oily Parts. (2.) Because it is bitter. (3.) From its rank Smell, like *Semen virile*; volatile Salt *alone* having *only* a quick or urinous Smell. (4.) Spirituous, or other sulphureous *Menstruums* dissolve it, if reduced to an Extract, which softens with a dry Warmth. (5.) It is inflammible.

(VI.) The oily and volatile Salt of the Opium are intimately combin'd; as appears, (1.) By the Difficulty of their Separation. (2.) By the Redness of its Tincture; for when the oily and sul-

phureous Particles are loose therein, they either constitute a white Colour, or leave the volatile Salt perspicuous. (3.) Because it imparts its Tincture, specifick Smell, and hot and bitter Taste (which depends both upon volatile Salt and Sulphur) to all *Menstruums*. (4.) Because it will hold its Virtue many Years, which it could not do without this *Combination*. (5.) Because it has its Effects upon the venereal Membranes, after it has pass'd all the common Secretions. (6.) Yet after all *this*, it has its Effect upon the Skin, by causing Itching, &c. and the Sweats will smell strong of it, which shews, that the specifick Combinations of the oily and volatile Parts baffle all *Cotions*, *Digestions*, *Circulations*, and *Secretions*, that it has undergone in the whole Body, and that its volatile Salt is inseparable from its Sulphur, and *both* are very naturally apt to combine. Therefore *Opium* acts and produces its Effects as a *Sal volatile oleosum*, somewhat more active than that in our Membranes, whose Principles are most intimately and strictly combined, and *so*, that it is highly qualified for our Purpose, when separated from its resinous Part.

Opium does not act as an Alterative of the Blood, but by pleasantly affecting the *sensible* Coat of the Stomach by a most charming and captivating Titillation, that actuates and causes a fine *Ovation*, and calm Glowing of the *Spiritus Insiti* of the Stomach, and not by altering the Blood, to which even the largest Dose of *Opium* bears no Proportion to cause any remarkable Effects; and it were not otherwise possible that so small a Quantity should have such remarkable Effects, and that too, *before* it was out of the Stomach; and which Wine cannot have, however taken, for want of that fine titilating *Sal volatile oleosum*, which *Opium* possesses.

Thus

Thus *Opiates* moderate Fluxes, even before they are out of the Stomach, because the Pleasure *there* relaxes all Parts, and so causes an Expansion of the animal Spirits, and looses the Sense of the Irritation, *because* the expanded Spirits cannot carry the irritating Impressions to the sensitive Soul, which they must do, to cause a Sense of Irritation.

And so, by the same Reason, sitting upon a warm Board or Stool will moderate a *Diarrhea*, because the Pleasure of the Warmth *relaxes*, and so takes away the Sense of Irritation by the Expansion of the Spirits; and *thus* *Opiates* cause a Redness in the Skin, just as Sleep or Wine does, *because* the Skin being relaxed, admits the Blood to come into all Parts freely; as on the contrary, *Fear*, *Cold*, &c. contracts the Parts of the Skin, and repels it. And *after this manner* old Topers acquire red Noses, by frequent Relaxations of the Skin, which Wine-bibbling is a Cause of, by enlarging the Channels of the Blood.

Opium does not cause Sleep from a certain specific Property *in itself*; but all the Disposition it makes *that Way*, is by the Relaxation that its Pleasure causes; and so fine Musick, agreeable Frictions, the Whistling of Winds, &c. carry a great Promptitude to Sleep, *for the same Reason*, tho' in far lower Degrees.

It stops Vomiting, by relaxing the Stomach, which is a Motion contrary to the Contractions by which Vomiting is performed; and it helps a *Singultus*, and other Contractions, for the same Reason.

It causes Sweat, by relaxing and opening the Pores of the Skin, as it also provokes the *Menses* to flow, by opening or relaxing the *Via* or Pores they issue out at; as on the contrary, Cold, Sorrow, Pain, grievous Passions, &c. close those Parts.

The same Effect it would have in causing Delivery; *but* then it would abate the Throws, and so retard it, and cause several other disagreeable Symptoms.

It causes Urine by its volatile Salt, titilating and relaxing the Pores of the Kidneys. And *Nauseas* in the Stomach, and *Swimmings* in the Head, by Consent of Parts, when its Resin adheres to the Stomach, which bring on Contractions of the Membranes of the Brain (which Membranes are extreme sensible) by which the *animal Spirits* are compress'd grow unquiet, and skip up and down; and the Compression not being continually alike, the Arteries afford an uneven and forcible Supply of them from the Blood, because the Compression does not affect all Parts of the Brain with *equal Force*, and from *thence* arise *Eddies, Vortices*, or Whirls thereof, which are the Cause of *those Swimmings, Vertigoes, &c.* according as they happen to be mov'd: And by *Consent of Parts* is meant nothing but *Contraction or Relaxation*, which suddenly affect the whole *System* of the Nerves and Membranes.

Opium, contrary to its usual Manner of Operation, sometimes causes Watchings in such as are of moveable Spirits, by actuating and stirring their Spirits by its volatile Salt, and yet at the same time pleases the Membranes, and relaxes the sensible Parts, so causing an *Indolence*. As some have a restless Ovation of their Spirits that will not suffer them to sleep, (tho' in a pleasant State all the while) upon Excess of Joy, or good News, &c. a *Quietness of the Spirits* being as necessary to cause Sleep as *Relaxation*. But *Relaxation alone*, and thereby Expansion of the Spirits, (so that they carry Impressions smartly) is sufficient to cause *Indolence*; and sometimes too large a Dose will so excite and actuate the Spirits, as to cause Watchings.

Opium

Opium often purges Dogs, and People of a *canine Appetite*, because of their strong Digestion, and fixed Salts at Stomach, which subdue the Volatility of the *Opium*, and dissolve its Resin, and so it becomes Cathartick; as acrimonious Resins and Emeticks, subdued by fixed Salt, use to do, and often prove by that Means purgative.

But Melancholy often happens after its Operation; when the sweet Pleasure is over, then follows Sadness, as all Pleasure is observ'd to leave a Man worse than it found him: And so *post Coitum* a Man is sad and dejected, the Pleasure remaining in the Memory only, and a painful sort of Sensation overwhelming a Man, makes him pensive, and in an universal Disorder.

By the Use of *Opium*, Death is caus'd two several Ways; (1.) Either by an utter Expence of Spirits, and thereupon a *Dereliction* or *Extinction* of the *sensitive Soul*, by reason of those *Distresses*, caused by the Resin of the *Opium* adhering to the Stomach. Or, (2.) By too much Relaxation, disabling all the Motions of the Body, like such as lie *dead drunk*, as we commonly say. *Paracelsus* says of it, *Tam homini quam Morbo somnum conciliat, viz.* That it puts the Disease *asleep* as well as the Man.

It must not be torrify'd, because the most volatile Part is thereby lost, and because the resinous and earthy Parts (which are not spent that way) grow more in Proportion to the *Sal volatile oleosum*; and the common Pretence of thereby destroying its *narcotick Sulphur* (a By-name for the best Parts of the *Opium*) is very trifling and silly.

Nor ought it to be extracted from *Spir. Vini*, or any spirituous Liquid, because they are more apt to call out its offensive Resin than its *Sal volatile oleosum*; nor ought it *first* to be extracted in Wa-

ter, and then in *Spir. Vini* ; and then mix, and so evaporate to an Extract, as is practis'd by many ; for this is only adding the Resin extracted by the *Spir. Vini*, to the *Sal volatile oleosum*, extracted by the Water, a great Part of which will be lost in the Evaporation.

But in its Preparation we must separate its *Sal volatile oleosum* from all its Resin, Earth, Filth, and Dross, and yet no way weaken or alter it, nor add new Qualities to it ; and therefore Dr. Jones forbids all Use of Fire in its Preparation ; he only extracts a Tincture, cold, from distill'd Rain-water, which, he says, readily imbibes the *Sal volatile oleosum* of the Opium without Fire, Heat, or lixivial Salts, nor imbibes any of its Resin ; and when so prepar'd, he calls it a *Panacea* of Opium ; the Preparation of which the Reader may see in his *Mysteries of Opium reveal'd*, p. 278.

How far such a Preparation of Opium may answer, I shall not determine, because I never tried it ; but I am very sure that it will not keep very long : And I also know, that *Laud. liq. Cydoniat.* rightly prepared, and *solid Laudanum* impregnated with volatile Salts, Camphire, and Chymical, Aromatick, and Carminative Oils, as I know how to compound it, are (amongst many others) efficacious and safe Hipnoticks, and without the least ill Consequence attending, if in the Hands of a wise Man.

However, if it be by Tincture that you make it, it is better only to decant it instead of expressing it ; for otherwise Part of the Resin will press thro', which is carefully to be avoided ; and the spumous Matter is to be scumm'd off as it rises, as good for nothing.

The Operation of Opium is more quick in a liquid Form, but in a solid one more durable. Give the Liquid half an Hour or an Hour before the Time

Time you would have it operate; and the *Solid* an Hour or an Hour and a half before such Time.

It ought not to be given immediately *before* or *after* Phlebotomy (especially if it be large,) because the Patient being dispirited, and generally inclin'd to sleep *without an Opiate*, he will be apt to sleep too much *with one*: Besides, *Opiates* relax, and hinder the Vessels duly contracting upon the remaining Blood.

If it be taken to cause *Euphory*, or a brisk Effect *only*, and not to procure Sleep, it is best in a Morning; because the Refreshment gain'd by a Night's Sleep both concurs to the *Euphory*, and opposes Sleepiness.

In an Over-dose of crude *Opium*, if Vomiting attends, because of the Resin sticking to the Membrane of the Stomach, it is not best to promote the Vomiting, in hopes thereby to move the Resin, (for that will be a hard Matter) lest we torment the Patient afresh; nor are we to stop it, if we could, (which is seldom possible) as not knowing what Nature may advantage herself by such Ejections.

But the Cure consists in the Dissolution of that Resin in the Stomach, which is most effectually done by lixivial Salts, as *Sal Tartar. &c.* or Sulphureous Spirits, as *S. V. rect.* or *Sal Tartari*, mix'd with it, and so exhibited; or raw Yolks of Eggs swallow'd down at due Intervals, or *Sapo alb.* or *Sapo tartar.* and repeat them after every Vomiting; and when it ceases, give good Wine or *Spirituos Cordials*, and if need be, *Spirituos Catharticks*, as *Tinct. sacra, &c.* but beware of *overdoing* with *Spirituos Things*.

But if the Mischief be from an *Over-dose* well prepared, and free of the *Resin*, (which we must be very sure of) then we may give a brisk Emetick
to

to discharge the Opiate, and cause Contraction of Parts; and after the Vomit has wrought three or four times, give half an Ounce of *Crem. Tartari* in Broth, or any other convenient Vehicle; and this will go near to turn the Emetick to a Cathartick, and help Contraction. This may be done, if the Party has any Sense; but if he be stupid, expose him to the Cold; and, if possible, keep him in Motion, pinch him, and put him to Pain; and if all this will not do, and no Hope of Life remains, plunge him into cold Water, or pour Water suddenly upon him, both which will cause a sudden Contraction of Parts.

All the while (except the Time of Vomiting) ply him well with Acids, which will both help to dissolve the Opium, and contract the Parts.

If there is a Suppression of Urine, put his Members, (or *Scrotum* at least) into cold Water, or throw Water forcibly upon the Region of the Bladder.

Opiates are not proper in general Relaxations, (as such) as universal Palsies, *Hemiplegia's*, or Palsies of one Side, Palsies, or Deadness of the Eyes, Dilatation of the Pupil, Relaxation of the *Timpanum* of the Ear, or Relaxation of one Side of the Face, Relaxation of the *Uvula*, *Larynx*, Wind-pipe, and *Pharynx*, a paralytick *Asthma*, a Relaxation of the Stomach, Palsy of the Intestines, or Bladder, or of the *Sphincter vesicae*, or *Ani*, in Ruptures, *Prolapsus Ani*, *Uteri*, or *Vaginae*, in apoplectick, soporouse Cases, Lethargies, *Coma's*, Weakness of Memory, Stupidity, *Syncope's*, Dropsies, Tremors from Old Age, *Diabetes*, *Fluxus Chilosus*, Aptitude to Abortion, in Cases where Expectoration is wanting (as in Pleurisies, Spitting of Blood, *Peripneumonia's*, &c.) nor when a *Crisis* is to be help'd, by grievous Sensation or Irritation, because Opiates take off the Sense of Irritation,

tation, (but when the *Crisis* is to be help'd by *Relaxation*, as by opening the Pores, to cause Sweat, Perspiration, &c. then they may be safely administred) nor may they be given in *Priapisms*, Venereal Furies, Itchings of the *Uterus*, *Scrotum*, Skin, &c.

Where they are of Service, it requires great Skill to prescribe them aright, especially in *Deliriums*, where *sometimes* it does great Service, and at *other times* as much *Mischief*,; and indeed in no one Case ought Opiates to be meddled with, but by Men of the greatest Knowledge.

And altho' *Opium* taken inwardly may so affect the Spirits, as to stop their Activity, and by Relaxation take off Pains, yet it is a great Question, whether it is really an Anodine, or not, if outwardly apply'd; for it abounds with a fiery, volatile Salt, and strong, fetid Sulphur, is bitter, inflammable, acrid, and so very hot, that some think it in the highest Degree of Discutients, and almost a Caustick; and so it seems but ill suited for an Anodyne, whose Business is to cool the Fervour that Pain rais'd in the Part, to afford a benign Moisture, to dilute and temper the Acrimony of irritating Salts, and supple and mollify the tense, distorted, nervous *Fibrilla*; so that the Solids returning to their due Laxity, Temper, and Position, the Fluids may freely flow again thro' them, as Nature appointed.

In giving *Laudanum*, we are at a greater Certainty, in the *Solid*, than the *Liquid*; for *Drops* may contain *more* or *less* of the *Opium*, according to the Preparation or Manner of dropping them, but not so in the *Solid*: And whereas *that* is apt to dry by keeping; that Inconveniency will be prevented, if a little *Sal Tartari* be added to its Composition in the making, and then proportion the Dose accordingly.

And whereas in making *Laud. Liq. Cidoniat*, Yest is order'd, it is certainly wrong to do so, for it makes it muddy ; therefore a very ingenious Physician says, that if, instead of Yest, we substitute Juniper-berries, the Medicine will be more pleasant to the Eye, and also lose its gripping Quality, which indeed seems rational.

And it is to be noted, that if *Liquid Laudanum* be made with an Acid, it is not so apt to make the Stomach sick, nor cause Vomitings, as the other Sorts often do ; and Reason seems to attest to the Truth of it, notwithstanding Dr. Jones's Tryumph, in his *Panacea*, made of distill'd Rain-Water, and crude *Opium*, before-mentioned.

In *Maniacks*, a quadruple Dose of *Opium* will hardly produce any Effect, because their Minds are taken up by the *Ideas* of Love, Fear, &c. so that they are not so easily diverted by those pleasing Representations which they would otherwise attend to, and on which the Virtues of *Opiates* do in a great Measure depend : Besides, those Sort of People do wonderfully bear the Injuries of Cold and Hunger, &c. and have an amazing Degree of muscular Strength, which shews that the Texture of their Blood is very strong, and the Cohesion of its Globules great, so that the spirituous Parts of an Opiate cannot make that *Disunion* and Rarefaction of this Fluid in them, which it does in ordinary Constitutions.

The *Influx* of the *nervous Fluid* into the Organs of the Body, and its *Reflux* towards the Brain in Sleep, is very inconsiderable, muscular Motion being, at that time, scarce any ; for which Reason Sleep, a Time of Refreshment, and a steady Course

of

of the Blood (as in time of Sleep) are the most proper for Nutrition, which, when in a Hurry, is apt to be wash'd away, and torn off, &c. Thus continued Labour, or Exercise, causes Sleep, because they exhaust the *nervous Juice*, or lessen its Influx into the Organs of Motion, ease the *Tension* of the Parts, and so *incline* the Mind to *Repose*.

The Stomach being distended with Food, presses upon the descending Trunk of the *Aorta*, and causes a greater Fulness in the upper Parts; and the Brain being loaded, the Derivation of the Spirits into the Nerves is diminish'd; and this (with an agreeable Sensation which the Stomach at that time enjoys) is the Cause of a Drowsiness so common after a full Meal.

Now those who take Opiates in large (but not in too large) Doses, are so transported with the pleasing Sense it induces, that they lie in a sort of *Raptures*: And tho' they do not *always* sleep, yet they enjoy such a State of *Indolence* and *Quiet*, that no worldly Pleasure is to be compared to it: The pleasing Images which are then represented to the Mind are so strong, and so much engage the Fancy, as to hinder Sleep, yet yield Pleasure *like a Dream*.

Now, the easing of Pains, and checking Evacuations, by Opiates, proceed not only from the Minds being taken up with a pleasing *Sense*, whereby it is diverted from a *disagreeable One*; But all Pain being attended with a *Contraction* of the Part, the *Relaxation* of the Fibres (which Opiates are the Cause of) destroys the Sense of the *Stimulus*, and so gives Ease and Freedom from Pain.

Silvius cautions, to give Narcoticks in small Doses, and repeat them often; and in Cholicks, where Purgatives are required, if the Pain be
very

very violent, and like to be inflam'd by the Cathartick, it is a good way to mix a moderate Dose of some good Opiate with it well corrected.

Willis tells us a Story of a Dog, that had swallowed two Drams of *Opium* in Soup, and soon after he became stupid, and in half an Hour voided a great deal of stinking Matter, both upwards and downwards; and in an Hour he became perfectly well again, and brisk. And *Dr. Mead* tells us, that he forced into the Stomach of a small Dog about half a Dram of crude *Opium* dissolv'd in Water, which he soon vomited up, with a great deal of frothy Spittle; but repeating the Dose three or four Times (by holding up his Head, and beating him) tarrying about a Quarter of an Hour between each Dose; when the Dog had thus taken about two Drams in an Hour, he began to sleep, but presently started up with Convulsions, fell into universal Tremors, his Head constantly twitching and shaking, he breathed short, and with Labour; and at last lost entirely, first, the Use of his hinder Legs, and then the fore ones, which were stiff like a Stake: As he lay snorting, the Doctor, to hasten his End, was giving him more of the Opiate; but on a sudden his Limbs relax'd, and he dyed.

Upon opening his Ventricle, it was found very much distended, but empty of every thing except some Water and *Opium*, with some Parcels of frothy *Mucus* swimming in it; the Inside was as clean as if Scrap'd, and wash'd from all the Slime of the Glands, with some Redness here and there, like the Beginning of an Inflammation: The *Pylorus* was contracted, the Blood-Vessels of the Brain very full, and a large Grume of concremented Blood was found in the upper Part of it; but

but no extravasated *Serum* was found in the Ventricles, nor among any of the Membranes, which is worthy our Observation.

Of CORDIALS.

Their Operation explain'd.

WE shall not enquire into the *Etymology* of the Word, nor shew how it refers to the Heart; but shall *only* take it in the common Acceptation of the Word, for a Medicine comforting the Spirits.

Our Spirits being separated from the Blood, do in some measure partake of its Nature; and then, as the Spirits may be differently altered, its plain they may require very *different* Medicines to be refresh'd by; and this appears evidently in hysteric Cases, in which *sometimes* the most offensive Things are Cordials; and the Truth is, there can be no such Thing as an universal Cordial; but Things will be *so* as they are apply'd: as Wines, and all spirituous Things are generally esteem'd *Cordials*, and yet they are far from being *so* to Men fatiated with them; for in *that* Case, the more they drink, the more their Spirits are oppress'd, their Understandings clouded, and their Strength destroyed.

So, in burning Fevers, instead of being Cordials, they nourish the *Febrile Flame*; therefore the best Cordial then is, to deliver the Spirits from their Oppression; which is not to be done by spirituous Things, which only increase the *Heat*, but by Water, small Beer, cooling Ptisans, and such

such inoffensive Liquors, which are much more comfortable Cordials *at such a Time*.

But as to Cordials, as People generally take all distill'd Waters, that are spirituous, to be, by reviving and rejoicing the Spirits, the Manner of their Operation is *this* : As soon as they are received into the Stomach by a grateful *Appulse*, they refresh the Spirits that are waiting, as it were, in the Porch ; and then they affect others, onwards successively, the *pleasing Ovation* undulating thro' the whole System of the sensitive Soul in a Moment ; and so the Brain and *Præcordia* being recruited with a full Influx of exulting Spirits, perform their Functions with new Alacrity ; and the Pulse rouseth itself, and by strong Vibrations turns round the Wheel of Life with Vigour. But it depending upon a *Blast* of so fugitive a thing as *Spirits* in a Cordial, it holds but for a Moment : For which Reason, (if it could be) generous aromattick Electuaries should be substituted in their Stead, because their grateful Warmth and *Effluvia* would not so soon go off the Stomach.

Again, a Cordial communicates its Effects, by adding to the Springiness of the Fibres ; of which *Fibres*, the Solids of an human Body are composed. Now, the more spirituous any thing is, the sooner we feel its cordial Effects ; it being so fine and subtil, that it seems to soak into the Nerves, as soon as it touches them ; whereupon their Vibrations are invigorated, and all Faintness remov'd ; and upon the same Account it is, that Volatiles strike the Nose, being so very subtil as to affect the *olfactory* Nerves, as soon as they come at them : And in this Manner it is, that the *Effluvia* of Flowers, Fruits, and all Odours are esteemed Cordials, which operate upon the Organs of Smelling. And so all Things that leave a pleasing *Pungency* on the Taste and Smell, have
a Title

a Title to this Denomination, being stock'd with many subtil Parts, which, when dissolv'd by Digestion, and mix'd with the *animal Fluids*, are, by Reason of their *Fineness*, capable to enter into the most slender *Fibre*, and recruit the *Waste* their continual Motions do make of their necessary Moisture; and here all Aromaticks, and sweet-scented Ingredients, come in for a Share in *this Class*, in Proportion to the *Volatility* and *Subtily* of their Parts.

And *thus*, when we say that such a Thing is a Cordial, or comforts the Heart, strengthens the Brain, &c. we understand *only* this, (*viz.*) *That it is fit to make a Part of the nervous Fluid, and maintain the due Motion and Vigor of the Solids.* And as a Constitution wears away with Age, *such Things are necessary*; for when (as in Age) the digestive Faculty grows languid, and is not able to keep up a due Supply from usual Diet, then such Things as are cordial are *very useful*, they being fitted to wear out all undue Mixtures, and to invigorate the whole nervous System with a new Supply of Spirits.

But as to those Mixtures, to which the good Women give the Name of Cordials, as simple Waters, dulcify'd with *Syr. Caryophyllorum*, &c. set off with Leaf-Gold, &c. there is so little of a Cordial in them, that a Glass of Spring Water sweetened in the same Manner, is as good a Cordial to the full: But, *Si Populus vult decipi, decipiat*, &c.

Of CHALIBEATS.

Their Operation explained.

L Emery says, Iron far exceeds Steel for medicinal Uses, because it is not so compact, and dissolves easily in the Body, and more freely gives out its Vertue.

All metalline Particles (and particularly Iron) that will mix with the Blood, must, by the necessary Laws of Motion, from their *superior Gravities*, break their Way thro' the Glands and Capillaries, where Particles of inferior Gravities cannot pass thro': And Steel or Iron has not only this Property *in common* with some other Metals, but from the Texture of its component Parts, it is a most powerful *Deobstruent* also: For we are convinced of its pointed, angular Form, both by our Taste and Sight; and Chalibeat Particles being of an elastick Nature also, they heat and thin the Blood, by promoting its intestine Motion, as well as help it thro' its Passages, by increasing its Weight and Force against them.

And it is of that Nature, that it will astringe the Bowels, and provoke Urine also at the same Time: And to understand how two such *contrary Qualities* can display themselves at once, we may account for it thus, *i. e.* Its styptick, corrugating Taste upon the Tongue, arises from the Points and Angles of its Particles: Now, when in the Bowels these Particles touch any of the Fibres of their inner Coat, they naturally *contract*, whereby they will be gently drawn into such *Corrugations* as will inable them to retain their Contents longer; and the *Faces* also will be *hereby* hardned and contracted,

tracted, as Leather shrinks up at the *Contact* of Fire, or any *subtil Acid*. But the Case is quite otherwise, when these *Particles* are strain'd into a *Fluid*, as fine as themselves, and when they are *propell'd* in Canals with great *Velocity*, the strong and frequent Vibrations of the Artery prevent any such *Contacts* as was admitted in the Bowels, and only serve to propagate their Motions; so that they can do nothing here, but go on with their Current, until their Force strikes them thro' some secretory Outlets: But by their *Rapidity* they cannot but greatly contribute to thin the *Fluid*, of which they make a Part, and dispose it more to supply the thin Secretions, of which that by Urine is the chief,

Query. *How it provokes the Menfes?* Sol, by its heating the Blood, (*viz.*) by rendering it more swift and *fluid*, whereby it takes up more Room, and presses harder against the Sides of the Vessels, and by increasing the Quantity of its Impulse, it also presses or strikes harder against whatsoever opposeth it, that it sometimes even breaks the Vessels themselves, especially when their *Obliquities* are greatest in Proportion to their *Capacities* and Distances from the Heart; and such are the *Uterine Blood-Vessels*.

If when we give Steel, we only design to exalt the *Crisis* of the depressed Blood, and corroborate the *System* of the Spirits, we ought by no means to give any Catharticks.

But, if with the Exaltation of the Blood and Spirits, *Obstructions* are also to be removed, and muddy Settlements carried off, then Aloes, and such deterfive Catharticks and Chalibeats mixed, and so uniting their Forces, operate to Purpose, and best; altho' the great Sydenham holds, that Catharticks are to be forborn all the while that Chalibeats are taking; because their Virtues will

else be *infringed* by the Cathartick, especially if it be of the *Drastick* Kind, which must needs be understood with the abovesaid Distinction only.

If in the Use of Steel, the primary Intention be to correct the deprav'd Ferment of the Stomach, Chalibeat Electuaries, or Powders, are the most proper Forms. But if the Exaltation of the Blood, Opening Obstructions, and Rectifying the Habit, be the main Design, *then* Chalibeat Wines are more *preferable*, because they sooner, better, and more intimately mix with the Blood, and circulate with it to all Parts of the Body.

And tho' it will bring Relief in all Diseases having their *Origin* from Crudity and Poverty of the Blood, and restore the red Globules, that before look'd pale and watery, to a perfect, spirituous, brisk, sparkling State, and force its Way thro' all Obstructions, so as to bring Nourishment, Heat, and Life, even through the minutest Canals, to every individual Part of the human Frame, *provided* the Blood be capable of the requisite, lusty, *juvenile* Fermentation, and its Principles not decay'd by Age, the *Fibres* worn out, its *Tone* not broken, the Passages not fallen in, nor the Body in a *shatter'd*, ruinous State and Condition; yet, if the Patient labours under *these Disorders*, 'twill be as easy to reduce a wither'd Rose to a flourishing one, Vinegar into Wine, Mutton into Lamb, or old Beef into Veal, as to reduce him to a healthy Condition: And for *these Reasons* it is, that Old People so *very rarely* receive any Benefit from *Chalibeats*, and that we attempt to repair an old decayed Carcass so commonly by *them* in vain, says the ingenious Dr. Fuller.

If in taking Chalibeads, the Stools have *no* Blackness, it is a Sign that the Steel is not carried off. In that Case a Clyster may be exhibited, or even Catharticks, mixed with the *Chalibeads*, rather than to have the Steel plugg'd up in the Body. *Primrose de Morb. Mulier. 176.*

Tho' it be a common Opinion, that Exercise is to be used after taking of Steel, yet some Patients cannot bear to do so, but it will make them sick, and stir up Belchings; but if *such* Patients take it at Night, and go presently to sleep, it will agree with them well enough.

Some conceit, that the principal Use of Steel is to destroy Acids, and therefore are most *vehemently* against preparing it with *Acids*; but if they would serve their *Hypotheses* less, and consult Experience more, they would soon be convinced, that *Acids* are the best Key to unlock Chalibeads with, says *Fuller*.

Who also highly commends a Decoction of Agarick, as being very admirable for Green-sickness Girls, to prepare them for Chalibeads. His Form is this, *R. Agarici (concis. & nodulo lig.) ʒij coq. in Aq. Font. q. s. ad ʒiiij. sub finem addendo Garioph. Contus. ʒss. coli admisce Scamon. prepar. gr. iiij. Syr. Ros. Sol. ʒj. Ol. Anisi, gutt. i. f. Potio.*

Of CATHARTICKS;

The Manner of their Operation explain'd, &c.

THEY being received into the Stomach, vellicate and stimulate its *Fibres*, and increase the digestive Faculties, that is, bring the Muscular *Fibres* of the Stomach, and the Muscles of the *Abdomen* and *Diaphragma* into more frequent Contractions, 'till the Cathartick gets into the Intestines, whose *Fibres* and Glands being more sensible than those of the Stomach, they easily move, and bring them into forcible Contractions, whereby these Glands are squeezed of a Fluid, which lubricates the Passages, and mixing with the feculent Matter of the Intestines, renders that more Fluid also, in order to pass more easily into the *Rectum*, in order to be ejected by Stool. This is the Use of the more gentle Purges, which operate only in the Intestines, but those of greater Energy, enter into the Mass of Blood by the *Lacteals*, and often produce many unnatural Fermentations, and by vellicating the *Spiral Fibres* of the Arteries and Veins, bring these into more forcible Contractions, and thereby promote Circulation, and increase the *Velocity* of the Blood; wash away Obstructions, which may happen to be in the more direct Arteries, or those complicated ones which constitute the Glands; increase insensible Transpiration, and purify the Blood of all the grosser and more noxious Parts, by the *Ductus Choledocus* and *Pancreaticus*, which empty themselves into the Intestines.

The *Peristaltick* Motion of the Intestines is such, as continually helps on their Contents, from the *Pylorus* to the *Rectum*; and every Irritation either

ther quickens the Motion in its natural Order, or causes some little Inversions in it.

And in both, what adhered to the Coats, or inner Membranes, will be loosen'd and shook off, and carry'd forwards, and they will also be more agitated, and so render'd more fluid; and so it is plain how a Cathartick increases the Discharges by Stool; but the same Manner of Operation carries its Effects much farther, in Proportion to the Force of the *Stimulus*; for where it is great, all the *Viscera* in the *Abdomen* will, by the consent of Parts, or Communication of the Nerves, be so *twitch'd*, as to effect their respective Juices in the same Manner as the Guts do their Contents; the Consequence of which must be, that a great deal will be drain'd back into the Intestines, and made a Part of what they discharge. And if we consider the great Number of Glands in the Intestines, with the Outlets of these *Viscera* opening thereinto, and in particular of the *Pancreas* and *Liver*, it will be no wonder what great Quantities may be carry'd off by only *One* strong Purge.

And upon another Account also, besides that of a *Stimulus*, may the Operation of a Cathartick be accounted for; and that is, by *fusing* the Humours, and rendering them more *fluid* than they were before; whereby they are better disposed to pass off by their proper *Emunctories*. Those which consist of active and subtile Parts, when they are got into the Blood, in any great Number, divide and *fuse* those Cohesions which obstruct the *Capillaries*, and also *scour* the Glands; and even every Pulsation throws something into the Intestinal Glands, which goes off by Stool, that the *refluent* Blood had wash'd away, and brought back from all Parts of the Body: Of this Tribe, are such Purges as are said to purge the Joints, &c. and whatever brings the Particles of a Medicine to a

Secretory Orifice, which are fitted for its Passage, either by accelerating the Blood's Motion, or breaking it into more Particles of that particular Size, will increase their Secretion.

Another Way of promoting the Discharges by Stool from *Fusion* (or rendering the Humours more fluid) is, to mix such Particles with them as prevent their running into viscid Cohæsions, and by degrees divide and break them, when in Contact, whereby they are made more fit to run off by the most proper Outlets; and this is done by Substances that have *rigid Parts*, gross, and full of Asperities, and these are many kinds of Salts, and tartarous Medicines; for these Bodies, mix'd with any thing *tenaceous* and *adhesive*, will destroy such Properties. Thus, if we mix a few Grains of Salt of Tartar with *Extractum Rudii*, (which of it self is very tenaceous) it will always immediately run into a dry Powder, and so *crumble*, as to be incapable of being made up into Pills: So likewise all *tenaceous* and *mucilaginous* Bodies, of much thinner Consistence, will by the like Means be render'd much less *adhesive*, and more dispos'd to *Fluidity*. And Catharticks of this Kind are generally too gross to pass the Lacteals; and so their Influence reaches no farther than their first Passages. And after this Manner Cream of Tartar, Manna, and all the milder Purges operate, that is, by separating and keeping from Cohesion the Contents of the Stomach and Intestines, which render them so fluid, as to run off the sooner, and in greater Quantities, by Stool, than otherwise they would do.

Gentle Catharticks are better in many Cases than strong ones, especially for weak Constitutions, and in the Jaundice, in Hypocondriack Affections, Gravel, and full Constitutions from hard Drinking, &c. for strong ones, tho' they force
off

off a great deal by Stool, yet they wear a Constitution to pieces, and too much overstrain the Springs of the Solids, that so by losing their Tone, they soon fill again; whereas the weak ones gradually break and divide the viscid Juices for the smaller Discharges, and by degrees wear off such *Adhesions* as had almost plugg'd up some of the *Viscera*, and scour the smallest Vessels in such manner, that the necessary Fluids meet with no Hindrance in their Circuit, &c. But they ought to be given for some considerable Time, such habitual Illnesses, as they are design'd to remove, not giving way on a sudden.

In the Cholick the peristaltick Motion of the Guts is often inverted; and a Cathartick alone ruffles Nature too much; therefore *Opium* is happily added to it, to procure so long a Truce from Pain, that the Purge may, *unfelt*, carry the offending Humour downwards; and in this Case Purges may be given stronger than ordinary, because the Disease requires it, and the *Opium* mitigates its *Fury*.

Pills are esteemed the best Purgers of the Head, because they abide longer in the Stomach before they dissolve: They also irritate longer; and so consequently draw Humours more forcibly from the Head and remote Parts.

Where you judge the Intestines to be smeared over with viscid Phlegm, it is rational to give a Preparative the Night before.

In the Fall of the Year, Purging Courses are not so safe as in the Spring, because the Summer Heat leaves the Body so dispirited, that is, the Fibres so lax and weak, that Purging brings on a Debility, and such a Relaxation, as suffers the Fluids to form preternatural Cohesions, to ferment and introduce Intermittents, and sometimes

times malignant Fevers; therefore, at this Season, they are very sparingly to be used, especially after hot Weather.

All Catharticks of the alloetick and resinous Kind, are render'd much brisker in their Operation, and yet rather milder, if a few Grains of *Sal Succini* be mixed with them: And this is done by its dividing the Parts of those Medicines so readily in the Stomach, that they begin to operate sooner than otherwise they would.

All lixivious Salts seem very agreeable Correctors for most Sorts of Catharticks, because they both divide their sulphurous Parts, and thereby render them less apt to adhere to the Coats of the Intestines, which often causes great Pains there; and because they assist in attenuating those Viscidities which ought to be carry'd off: And this is particularly evident in *Sena*, whose Cathartick Quality consists in its mucilaginous or gummy Juice, which, the more it is divided, it gripes the less in its Operation; and therefore half a Dram of *Sal Tartari* is, with good Success, put into each Dose of its Decoction.

Cathartick Rosins are apt to stick to the Folds of the Stomach and Intestines, and so cause Sickness, Gripes, and *Hypercatharses*; but mix'd with a little of the Yolk of an Egg, Sugar, and Water, like the *Potio alba*, it works very pleasantly.

Jalap will work with double Force, (says *Hoffman*) if *Antimon. Diaphoretic.* be added to it: Yet *Reedlin* reports, from *Welschius*, that *Cornachines* Powder was forbid at *Rome*, upon pain of being condemn'd to the Gallies; but for what Reason is not easy to determine, no ill Effect being found from it here, that ever I heard of.

Dr. Grew says, that two Drams of *Sena* will impregnate four Ounces of Water as powerfully as if twice the Quantity was infus'd in it; because

cause the Water will bear no more of the purgative Parts of that Body. Cream of Tartar is said to be its best Corrector; and that it ought only to infuse, and not boil; for then it will be less apt to gripe, &c.

Purges being not so quick in their Operation as Emeticks, have less Effect on the Stomach than they; but if the *Pilorus* happens to have more than ordinary Slime adhering to it, the Cathartick is stopp'd, sometimes, in the Stomach longer than ordinary, and proves Emetick; and so Emeticks prove Catharticks, if they pass into the Intestines before they operate.

Catharticks operate best upon an empty Stomach; but Emeticks (generally speaking) when it is not so: For Emeticks being design'd to cleanse the Stomach, would pass on too soon to the Intestines, were the Stomach empty; whereas meeting there with the pounded Food, mix with it, tarry in the Stomach, and so irritate its Fibres, and compel it to throw up its Contents; whereas a Cathartick, finding the Stomach empty, passes away to the Intestines, and exerts its Force there; yet if the Stomach was loaded beforehand, it would cause the Patient to be sick, and vomit.

We give some warm Liquid when the Cathartick begins to operate, in order to carry down any of its Remains from the Stomach, and to lubricate and defend the tender Coats of the Intestines from the Vellications and Acrimony of the Medicine; and therefore I think Broth the best of any Thing that can be used in this Case.

We forbid Purging in all the following Cases, (*viz.*) in Ulcers or Impostumes of the Intestines, Inflammations of the Stomach, Liver, or any Part of the Abdomen, in Women near their Delivery,

in

in Histerick Cases, in *Empyema's*, Hectick Fevers, inward Apostems, Consumptions, and some other Cases, best distinguish'd by the Physician; altho' there are some Catharticks that dissolve with greater Expedition, in the Stomach, than others, and so stimulate the *Porus Biliaris*, and press the Bile out of the Gall Bladder, and others, that make their Way thro' the *Duodenum* before they dissolve; and so shew most of their Strength upon the Humours lodg'd in the Glands of the Intestines; yet the Tinctures which different Catharticks impart to the *Excreta*, do not always indicate *what Humours* are most predominant in the Body; for Rhubarb and Aloes imprint a yellow Colour, both on the Urine and Stools; an Infusion of *Sena* or Vitriol, give the Stools a Black; which Blackness seems to be caus'd by those Medicines intirely mixing with the Salts and Sulphur of our Bodies in the first Passages: And thus different Purges, causing Stools of different Colours, at first gave Rise to those Appellations of *Cholagogues*, *Phlegmagogues*, *Mellagogues*, and *Hydrogogues*, as some say: But that there are specifick Medicines, I think, is irrefragably evinc'd, under that Head where we have treated particularly of them: And why there should not be specifick Catharticks, as well as other Specificks, is a Riddle not very easy to resolve; and if there are not, What need all the Variety of them, which are plentifully to be found, both in practical Authors, Dispensatories, and on all Apothecaries Files? Half a Dozen Sorts, to suit the Pallets and Constitutions of Patients, would be sufficient. I am very sure, that this same Dr. Quinsy, in his ingenious Writings, does very often recommend different Catharticks in different Diseases; but to what Purpose is it, if the Doctrine of Specificks is not true: Thus sometimes

times Great Men lose themselves, and the greatest may err; and I, that am but the *least*, am, I fear, guilty of great Mistakes; and where I am so, I am heartily sorry, and desire better Information.

But that there are specifick Catharticks *Galen* witnesseth, in his Treatise *De Purgantium Medicamentorum Facultate*, where he sharply reflects on those, who, in Opposition to *Hippocrates*, assert the contrary, and concludes, That every Cathartick draws to it self its proper Humour.

And Dr. *Keill* is very clear in this Matter: “ If,
 “ (says he) Medicines, which increase the Quan-
 “ tity of any Secretion, operate by uniting to
 “ and augmenting the attractive Force of the Par-
 “ ticles which compose the Humours, to be secernd,
 “ May not the Particles of some Humours, sooner,
 “ more easily, and strongly, unite to the Particles
 “ of some sorts of Medicines, than to another
 “ sort? And consequently, may not different Hu-
 “ mours require different purgative Medicines to
 “ carry them off through the Glands of the In-
 “ testines? And does not this re-establish the
 “ Doctrine of Elective Purges, confirm'd to the
 “ Antients by Experience and Observation; but
 “ rejected by the Moderns through a false Philoso-
 “ phy?” See *Essays on the Animal OEconomy*.
 Pag. 173.

Of E M E T I C K S ;

Their Operation explained.

A N Y Medicine, which so far vellicates the Membranes and Coats of the Stomach and Bowels, as to draw them into Convulsions, or twitches, or that more than ordinarily hastens their natural Motions, will be *Emetick*, or *Cathartick*, or both. But the Action of Vomiting is more properly a convulsive Motion in the Stomach, than in the Bowels, unless their peristaltick Motion is inverted: Whatsoever therefore comes into the Stomach, which so far irritates its Fibres as to make them contract, will throw its Contents upwards, the Vent being larger than that by the *Pylorus*.

The Difference between an Emetick, and a Cathartick, lyes *only here*, that a Cathartick consists of such Particles as pass the Stomach, without any violent Vellications of its Fibres; and an Emetick, of such as have that Effect almost as soon as they come *there*; so that an Emetick seems stronger than a Cathartick, and a Cathartick, in an Over-Dose, will prove Emetick.

It is of no great Moment, whether a Vomit is thrown up again, at the first or second Ejection, or that the following Motions are caused by the Acrimony of the Juices, which the first Motions pump'd but into the Stomach; but the Action of Vomiting gives the greatest Shake to all the *Solids* that any Motion is capable of. Some of the Motions generally discovering a Drain of Humours, into the Stomach, from some considerable Distance; their Colour shewing they were derived from the
Liver;

Liver, or more remote Parts; but it is not so much *what* Emeticks discharge upwards, as *what* their violent Strainings and Concuſions fit for Separation, and force through other Outlets.

Tinctures, Rosins, and Extracts, operate rougher this Way than more simple Preparations, because, in those Forms, the Parts of the Ingredients are divided too much, and by that Means they too intimately come into Contact with the Fibres, so that they are not so soon shook off by their convulsive Twitches, as more gross Parts may be: And 'tis upon *this Account* that the Simples, which come under this Head; (as the *Epepecouana* at present (for Example) are the best in their natural Dress: Chymical Pharmacy producing no Emetick so good as what Nature produces; all the *Antimonial* and *Mercurial* Emeticks being, by the present Practice, generally laid aside; unless in some particular rebellious Cases.

The *Epepecouana* is a divine Remedy in *Diarrheas* and *Dysenteries*, and it is both Emetick, Cathartick, and Astringent at the same time; there are two Sorts of it, Grey and Brown: The Grey is less violent in its Operation; but the other more certain. The Brown contains less oily Parts than the Grey, and fewer rosinous: From eight Ounces of the Grey has been extracted, by Spirit of Wine, ten Drams of a rosinous Extract, and from the same Quantity of the Brown, but six Drams: And from the Remainder, thus freed from its Rosin by an aqueous Menstruum, has been drawn from the Grey two Ounces of a saline Extract; but from the Brown only between five and six Drams, its Violence being owing to the Rosin.

When an Emetick operates too fiercely, put Salt into the Gruel or Broth the Patient drinks, and it will send it downwards. They

They may be turned to Alteratives by proper Mixtures : For Example, if *Aqua Cinamonis fortis* be mix'd with *Oximel Scilliticum*, it will convert it to an Alterative, and prevent its Operation upwards, if given in due Quantity.

Emetick Forms.

R. Warm Water lib. i. Sweet Oyl ℥iv. mix.

R. Green Tea ℥ss. boil it in Water, from lib. i. to ℥viii. for one Dose.

R. Oximel. Scillit. ℥vi. Sal. Vitrioli gr. iv. for a Child 4 Years old.

R. Oximel. Scillit. ℥iii. take it in a Draught of Posset Drink.

R. Oximel. Scillit. ℥i. Sal. Vitrioli gr. xv. Vin. Benedict. ℥iii. mix.

R. Oximel. Scillit. ℥ii. Sal. Vitrioli ℥iss. Aq. Cinam. ℥ii. mix. and take two or three Spoonfuls, twice or thrice an Hour, as long as Vomiting is desired to continue.

R. Oximel. Scillit. Ol. Amigd Dulc. aa ℥iv. take ℥ii. till it operates.

R. Groundsel m℥ss. Currants m℥ss. Anniseeds ℥ii. boil in ℥xii. of Ale to lb. ss. for a Draught.

R. Inner Rind of Elder m℥j. boil in Milk and Water aa lib. ss. till half be evaporated, then strain for a Dose.

R. Green Asarrabacca, from 5 to 9 Leaves, bruise and pour on them Ale or White Wine ℥iii. let them stand cool an Hour, strain and take it for a Dose.

R. Emetick Tartar a gr. i. ad 5 or 6.

R. Of Vinum Benedictum, from 20 Drops (a Dose for a small Infant) to ℥vi. or ℥i. to ℥x.

R. Of the Powder of Hypopocouana, a ℥ss. ad ℥ii.

These are the most safe and most common.

Now the Force of the Muscular Fibres of the Stomach, the Muscles of the Abdomen and Diaphragma

phragma (which two last occur principally in Vomitting) is affirmed to be equal to 260000 Pounds Weight; a Force (beyond all Dispute) able, not only to drive out all that can have an Existence in the Stomach, but to take away the Obstructions in many other Canals also.

The Particles of Emeticks, by their *Intruncation* into the Orifices of the *Emissaries* of the Glands, joining to the Surface of the Stomach, do dilate the same; and after the same Manner do dissolve the Cohesion of the *stagnant* morbidick Matter, and make it more fluid, and *thereby* render its Resistance less.

Now the natural Action of the Glands being Secretion, when the Contraction of their Orifices is remedy'd by their Dilatation, and by the Attenuation of the *Fluid*; the morbidick Matter must needs flow into the Cavity of the Stomack, till it be gathered in such a Quantity as to vellicate and force the *Fibres* of the Stomach, Abdomen, and Diaphragma (by the Communication of the Nerves of the first with the two last) into a violent Contraction, and throw all out by the *Oesophagus*.

If an Emetick proves Cathartick, its Effects seldom reach beyond the *Prima via*, (which contains all that Passage between the Mouth and the *Sphincter ani*) and is *therefore* without danger, because *there* the Canals are strong and wide, and the *Fluids* are *viscid* and *gross*. It is true, that there is some Hazard in a strong Vomit, least by over violent Straining, the capillary Vessels of the internal Surfaces be burst; and sometimes it is too violent for the Patient: But the first of these is prevented by precedent Phlebotomy, and the latter by the Care of the Physician.

Some Patients Vomit much more easily than others; and the Reason is, because their Fibres are

N. more

more fine, or because the *Mucus* which defends them is wore off; and, in that Case, the most innocent Food, will sometimes prove Emetick.

In the Operation of a Vomit, the Convulsions of the Stomach and *Diaphragma*, cause violent Concussions in the Liver, *Pancreas*, and Intestines, and squeeze out much of the pancreatick Juice and *Bile*, Part of which is ejected by the Mouth, and the other Part thrown into the Intestines; and the Extremities of the Nerves, and Arteries, which terminate in the Stomach, are irritated so that they throw off some Part of their Contents, by which some Part of an Emetick may force itself into the Veins of the Stomach, or the *Vena Lactea* in the Intestines, and so join in with the Blood, and cause a Coliquation of it, and provoke it to throw off larger Quantities of Humours upon the Stomach, to be cast up by the Mouth, &c. They are properly prescribed in intermitting Fevers, in the Beginning of malignant Fevers, in Asthma's, and Gouts; in strange Ferments of the Stomach, in Indigestions, or when the Stomach is loaded with cholerick or pituitous Humours; in Loathings, Propensities to Vomit, depraved Tastes, Bitterness in the Mouth, *Lienteria's*, &c.

But they are improper in *Plethora's*, for fear of an Eruption of the Blood Vessels; and in melancholy Persons, because they are not easily wrought upon, and their Blood being replete, with sharp irritating Particles, an Emetick is apt to provoke Convulsions, Spasmes, &c. and in a *Phtbisis*, they are pernicious, because the Contractions which they cause, and the Concussions which they make, are apt to lacerate the ulcerated Lungs, and bring on fearful Symptoms not to be remedied; but, if there be much purulent Matter contain'd in some remote Parts of the Lungs, which cannot be raised or pumped up, notwithstanding a violent laborious

laborious Cough, which almost tears the Patient to Pieces, then a timely Vomit sometimes brings great Relief; but this is to be done with great Caution. We are also forbid to give Vomits to pregnant Women (unless to promote Delivery;) as also to Persons with weak Eyes, because by the sudden arrival of too much Blood to the Head, (which an Emetick is often the Cause of) the Branches of the *carotid Arterie* may be so distended as to press down the Optick Nerves, and cause compleat Blindness.

And, notwithstanding the Prevalency of Custom, in ordering Gruel, warm Water, Posset-Drink, &c. to be taken as an Emetick operates, nothing can be so proper as thin, fat Broth; for that not only washes off the sharp Humours and Parts of the Emetick, that may adhere to the tender Fibres of the Stomach, but so covers them over with its greasy Parts, as hinders their being hurt by any saline Particles.

STERNUTATION or SNEEZING;

Its CAUSE.

IT is probable, that it is caus'd by the *dura Mater*, when it is contracted strongly, and forces the animal Spirits, with Impetuosity, into the Nerves dedicated to Respiration; for it is evident, *past Dispute*, that when we sneeze, the Membranes of the Brain are chiefly affected.

Sternutories purge and cleanse the Head, because they irritate the Spirits *indulating* in, and *irradiating* those Nerves that are disseminated into the

internal Membranes of the Nostrils: For the Spirits being provoked into Spasmes and tumultuous Transports, loosen the impacted viscous Matter, shake them out of their Place, and *eliminate* them through the *Infundibulum* and *Pituitary Gland*, out of the Confines of the Brain into the Veins; and so 'tis all inward, and out of sight. But as to that *Pus* that is cast out of the Nose by Sneezing, it comes no farther than from the neighbouring Glands and Caverns, and not from the Brain it self.

Dr. *Quinsey* discourses of *Sternutories* thus: " The
 " Fibres and Membranes within the Nostrils are
 " extreamly sensible; whatsoever *therefore* stimu-
 " lates them, makes them contract, and thereby
 " pulls those Parts they have any Communication
 " with; which, by degrees, brings on that general
 " *convulsive Shake*, that throws off the irritating
 " Matter: And every ones own Experience de-
 " monstrates, and best explains to himself, how
 " this is produced, and likewise manifests the great
 " Influences which may be communicated over
 " the Body by the Communication of *Fibres* from
 " an almost *unbeeded Sensation* upon the least Part.

" The salutary Effects of this forcible Concussion
 " of the *whole Body* are very considerable. There
 " are many Glands about the Head destin'd for
 " the Separation of very viscid and mucous Sub-
 " stances, by which Means many *Sinus's* or Ca-
 " vities, of some Service in the Oeconomy, are
 " frequently stuff'd with so much Matter, as
 " not to give that Room to some of the Vessels,
 " as it is their Office to do; *whereby* the circulating
 " Fluid, in some Parts, makes them *too turgid*,
 " which, upon many Accounts, will occasion un-
 " easy Sensations, Pain, Giddiness, and other
 " Distempers, frequently experienc'd in the Head.
 " By a particular Conformation, the Nose receives
 " and

“ and discharges many such superfluous Viscidities. Therefore Astimulus, from what we call Sternutories, will provoke those Parts to increase those Discharges, whereby a troublesome Load is drawn off, and the Head render'd brisk and lightfome.

“ It is of use as an Exercise, and there is no Motion, no, not even that of Vomiting, which so suddenly and forceably shakes the whole nervous System; so that in all Obstructions of the finer Passages, and particularly of the nervous Fluid, whatsoever produces Sneezing must be of great Advantage; and common Experience in Practice confirms this in many Instances of Paralitick, Apoplectick, and Lethargick Cases, where the Motion rouses and enlivens the Spirits, and by shaking the most remote Fibres, assists their proper Juices in Circulation, which before seem'd to stagnate, or not to irrigate the Fibres enough to maintain their natural elasticity; and of such great Efficacy is this Convulsion, that it is sometimes procur'd on purpose to assist the Expulsion of the Fetus, and with good Success.

“ How far the Custom of taking Snuff, as it now prevails, is serviceable or detrimental, we shall not here determine; but those that comply with it as a Fashion, put it out of their Power to receive any Benefit by it as a Medicine, for the Parts grow (as it were) callous and insensible, by a Continuance in taking of it: And it also spoils the Appetite, by passing down the Throat, as some of it will, where it is taken immoderately, notwithstanding all Care and Caution to the contrary.

FAT of ANIMALS.

Their NATURE.

R Eason cannot be convinc'd, that there are such Specifick Vertues as are ascribed to some of them in particular Cases: For they seem not possess'd of any Vertues different from other Substances of the like kind, unless what may arise out of their different Consistencies, and Degrees of Volatility: That of the Viper having something in it extraordinary, and different from all the rest that calls for our Regard; the Fat of which being apply'd to a recent Bite of the same Animal, is reported to work an immediate Cure; which Vertue is ascribed to it, from its clammy and viscid Parts, and because it is more penetrating and active than other oily Substances; by which property; it is supposed, to involve and sheath the volatile Salts of the Venome, so as that they can do no Mischief.

The Fat of all *Animals* seem to be more a *Ripener* than Oil, because they are more or less possess'd of a Share of what is subtil and volatile; whereby they enter the Pores, and bring the Humours to Maturity the sooner: Altho' (with Oil) they assist Maturation, relax the Fibres, and give the Part larger Dimensions; but because of the Animal Salts, even common Larde is more a Ripener than any express'd vegetable Oil whatsoever.

Of AROMATICKS.

Their Operation explain'd.

THEIR Taste, at first View, seems to depend upon their *Smell*; but besides their *Smell*, the greatest Part of Spices have a *peculiar Taste*, that the Tongue is not sensible of, 'till after *some Time*; for these require that their Salts be stripp'd, in the Mouth, before they discover their Taste, and then they give a lively Impression. Their Taste seems to proceed from *volatile alkaline* Salts, cover'd with earthy Particles, and qualify'd by an Oil, which is (in a Measure) tinctur'd with Acids, and accordingly they present us with a great many sulphureous odoriferous Parts, as are seen in Cloves, Anniseeds, Cinnamon, &c.

They are ally'd to the Ferment of the Stomach; and, by Consequence, fortify it, promote Digestion, dispel Wind, and help the Cholick: Their oily Parts put the Blood into a Ferment, and so cause Sweats.

They correct slimy Flegm in the Ventricle, and, by their volatile Oleose, quick Salt, nicide; and attenuate it, rouse native Heat, and cause a Return of Appetite and Digestion.

If Aromaticks are consider'd as Diureticks, they don't operate so much upon the Blood, as upon the Organs themselves; for it seems not their Business to unlock the too close Contexture of the Blood, and thin it, 'till it lets go its hold of the *Serum*: But their Operation consists in *this*, that by their Volatillity, Tenuity, and Activity, or Heat; they deterge and comfort the Reins

and Ureters, and stimulate them to the Performance of their Office.

“ Medicines of this Kind (says the most accurate Dr. Quincey) are of great Service to cold cathartical Habits, where the Load of Humours has been forc’d away by strong Detergents and Catharticks, and the Fibres are left weak, so as to be continually liable to a Relapse; because they strengthen the Solids, fill them with due Spirits, and procure such a vigorous Vibration and Circulation, that afterwards proper Digestion and Separation is made, and all supply cut off, which might occasion a Return. Things of this Nature, are therefore indispensably necessary after purging in Dropsies, or to be given in their Intervals; and for want of this Knowledge, many, whose utmost Acquaintance in Physick goes no farther than a few violent Purges, will undertake such Cures, and make *short ones*, by carrying off the present Load, but cannot prevent their filling again. The Cure, therefore, of such Cases, is not in reducing the Bulk, and bringing the Body to its natural Size, for that is much the easier Part; but in fortifying, with Medicines, under this Class, the main Springs of the *Machine*, that every Thing may go on regularly afterwards.

Of DIURETICKS.

Their Operation explain’d.

URINE is only a *serous* Part of the Blood, secern’d in the Kidneys, and convey’d thro’ the Ureters to the Bladder, and so to the *Urethra*; and

and *Sweat* is the same *serous Humour*, filter'd thro' the *cutaneous Glands*; Sweat and Urine having the same Original, only a different Way of Secretion.

This Serosity of the Blood proceeds from our Drink, and the liquid Part of our Food, and serves for a proper Conveyance of our Nourishment to the most solid and distant Parts; it dissolves the *saline Particles* it meets with; and, *by their Help*, unites with the *sulphureous Particles* of the Blood, and carries off such Portions from it, as are not useful for Nourishment.

Sometimes this Humour adheres *too closely* to the Blood, as when the urinary Passages are contracted or clogg'd with foreign Matter; or when the Consistence of the Blood is too viscous and tenacious; and it is as pernicious when its Motion is *too rapid* and impetuous, whereby it has not Time for Percolation into the Kidneys; for the thinner Separations increase in Proportion to the *Velocity* of the Blood, and its *too great* Motions keep its Parts too much divided; and tho' it brings it oftner to the secretory Outlets, yet it coming with such great Celerity, it has not Time to enter the Glands that are appointed for its Discharge; which, if continu'd, or if the Urine is long obstructed, it produces Dropsies, Catarrhs, Fevers, Asthma's, Rheums, and other like Disorders.

Therefore, in *either Case*, Medicines are to be exhibited suitable to the Occasion, *viz.* if the Blood is too viscous, *then* such as thin it, and separate its serous Parts; or if over rapid in its Motion, *then* such as calm and quiet it; if the Glands of the Kidneys, or Ureters, are obstructed by Gravel, Filth, or other Matter, *then* such as are either deterfive or mucilaginous, as the Symptoms indicate; but be it of which Sort it will, or
whatever

whatever the Cause is, if there be an Obstruction of the Urine, or not sufficient voided by the common Passages; whatever Medicines scoure away the Gravel, open the secretory Glands, and cause Plenty of Urine to be voided, are term'd *Diureticks*.

Plenty of Urine naturally occurs, when the Vessels are full of *serous* Humours, or if there is an Obstruction in the emulgent Veins, or if the Arteries send in a larger Quantity than the Veins can discharge, or when the serous Part is separated from the fibrous and sulphureous; which may be so done, by Diureticks, as to cause a *Diabetes*. As Dr. Fuller gives an Instance of in his *Daucus Ale*. in his *Pharm. Extempor.* p. 11.

The Office of a *Diuretick* is, (1) To enlarge the Serosity of the Blood, or carry it off when the Blood is over-run with it. (2) To put the Humours into Motion. (3) To fix its fibrous Parts, and allay the Impetuosity of the Humours, or wash off the Obstructions of the emulgent Arteries, and urinary Passages.

Of the *first* Sort are Mineral Waters, and White Wine; of the *second*, are *Tereb. Ven. Millepedes, Cepæ, Cantharides, &c.* and of the *third*, are *Spir. Nitri, Spir. Vitrioli, &c.* so that Diureticks differ very much one from another in their Manner of Operation; as for Instance, some are compos'd of alkalious Salts, as *Spir. Sal. Armon. Spir. Corn. Cervi, &c.* some are Acids, as *Spir. Nitri, Sulphuris, Vitrioli &c.* some are fix'd Salts, as *Sal Tartari*; some partake of volatile, and fix'd Salts, and Sulphur, as *Tereb. Ven. Millepedes, &c.* and some have none of these Principles, as the *Testacea, &c.*

If we give *Diureticks* to remove Obstructions of the Liver, Spleen, or Womb, we must shun the *acid* Tribe, because they fix or congeal the Sulphur of the Blood; but they are proper in Fevers,

Fevers, where its Sulphur is too highly exalted, and due Filtration is prevented by its violent Velocity.

If upon taking of *Acids*, the Patient voids *much Urine*, and after a little Time, *less of it*, it indicates, that the *Acids* have congeal'd the *sulphureous* Parts of the Blood, and the *serous Part* is evacuated; by which the remaining Part is intangled in the Sulphur, and so produces a Scarcity of Urine; for *Acids* prove Diuretick, by congealing the fibrous Parts of the Blood, and so giving the *Serum* an Opportunity to shed itself off by Urine, or Sweat. Their Operation upon the Blood I have accounted for, where I have discours'd of the Blood, and to that I refer.

If after a Disease, or a Debauch by drinking, the Urine is clear, it indicates, that the Blood abounds with *Serum*; but if after such Disease, or Debauch, or the Use of Sudorificks, the Urine is red, or highly ting'd with Salts, it shews, that the violent Motion of the Blood, has caus'd the Separation of so many Salts with the *Serum*, which has been the Cause of that *Tincture* in the Urine.

When the Blood is too much fus'd, the urinary Parts, Kidneys, or Bladder, inflam'd or ulcerated, or at the Time of a Crisis, heating Diureticks are to be shunn'd; that is, such as put the Blood into Motion, and are of sharp Particles; and such ought to be given (whenever administer'd) with some softening Medicine, to guard the tender Parts from their Acrimony, as with Emulsions, or Aq; Hordei, or Decoctions of Mallowses; cum Syr. *Althea*, and such like.

Diureticks dilute and carry off great Part of the Salts, that breed many grievous Distempers; they evacuate purulent Matter from the Breast and Joints, and are useful in the Jaundice, by precipi-

precipitating the purulent Matter and Salts by Urine; but *here* the *alkaline* Sorts seem best adapted to the Purpose.

N. B. The Exaltation of the Sulphur of the Blood is known by the Redness of the Urine, and Height of the Pulse; and in that Case, *Acids* are the best Diureticks, because they cause Concretions of the Sulphur, and yet they are prescrib'd in a violent Flux of Urine, occasion'd by Cantharides; so different an Operation may the same Medicine have, if apply'd by a skilful Hand.

Some Diureticks do not force either Stone or Gravel, (being Diuretick by Accident only) and some that dissolve the Stone, do not operate by Urine at all *directly*; and tho' all *direct* Diureticks, by forcing the Urine forwards, may wash away the Gravel they meet with; yet *that* does not strike at the *Cause* of the Disease, or hinder its Generation *de Novo*; and sometimes instead of Help, they *only* force it with more Violence upon the Parts; or if upon their Use they do bring away Gravel, they must not be too long continu'd, because they may bring on a *Diabetes*, or enlarge the Passages *so*, as to make Room for large Stones to plug up the Passages, as well as for Gravel to pass away.

Again, some Diureticks are more proper in the Gravel than others, (as some Sorts of Food are more apt to generate it) and some Acids (and some Sorts of Alkalies too) are pernicious in the Case, altho' others (as the Reason of Things may be) are very proper; but these Things remain *only* with Men of Learning.

In the Stone they are not to be administer'd, because they *abrade*, or wear off, that *mucus*, in which it lyes, as in a soft Bed; and *so* may not only cause it to hurt the Parts, but it thereby may endanger the plugging up the Passage of the
Urethra;

Urethra; and even in the Gravel they are not to be too long continu'd, because they open the Pores of the Kidneys, and give Opportunity to new Matter to degenerate into Gravel, as well as for the Reasons before-mention'd.

It is true, that all Medicines, yet found out, are so alter'd by passing the common Digestions before they come to the Reins or Bladder, that their Stone-breaking *Energy*, is wholly obliterated e'er they touch the Stone; especially the acid Sort (from which most Virtue has been expected) lose all their Acidity, (as soon as they pass the Stomach) and degenerate into a saline Nature, and become ineffectual to the Purpose they are exhibited for; and not only so, but being most of them not *homogene* to the Ferment of the Reins and Bladder, they weaken the Tone of their Parts, and destroy that Ferment which they ought to help, and so do Mischief instead of dissolving the Stone; and much more mischievous they prove, if injected into the Bladder directly: But this does not hinder but that there *may be* such a Thing as a *Stone Dissolver*; but then it must be of such a Nature, as not to yield to any Digestions or Ferments, thro' which it is to pass in its Way to the Stone: And why not as well a Medicine that will dissolve it, as some Sort of Food and Drinks that naturally generate it? Where is the Incongruity of believing the one more than the other? As for my own Part, I have, for some Years, been upon the Search for this *precious Jewel*, having try'd many, and different Menstruums to dissolve a Stone taken from an human Body; *but all in vain*, 'till of late, I was so happy as to hit upon it; a particular Chymical Menstruum, of my own, that dissolv'd it in a few Moments; and which I can, and will do at any Time, in the Presence of any Man of Sense, that desires it, and is a curious Inquirer into these Things, and that is desirous to see the Experiment, and will bring a
Stone

Stone to make the Tryal with : However this is not half the Work, for unless I can so dilute it, as to make it *poteable*, and as effectual a Dissolvent as before, the first Discovery signifies little ; *but* if I can be so happy as to do *that*, and that it will *then* dissolve a Stone *in* the Body, as well (altho' not so suddenly) as in its first Preparation, it did *out* of it, (as I hope I shall in due time :) I say, if I can once *but* do *this*, I shall think I have gotten the *Indies*, and possess a Treasure that no Man was ever yet Master of.

I know many Objections will be made against the *Possibility* of the Thing, and amongst the rest, that altho' it may dissolve the Stone out of the Body, yet it may not have the same Effect taken inwardly, because of its Mixture with different Ferments in the Body, and the Changes it there undergoes, &c. *but* if (as I hinted above) it is of such a Nature, as not to submit to any Ferments or Digestions through which it passes, this Objection is answer'd at once ; and if I can be so happy as to effect it, *let who will raise Objections* ; for Demonstration will be a sufficient Answer to every thing that can be objected against the Possibility of it : And at present, I shall only say, Why may not a benign dissolvent of the Stone carry its medicinal Energy to the Ureters and Bladder, as well as Turpentine, Sparagus, Cantharides, and such like ? Which we know to be fact ; and he that will argue against Fact is not worthy of any Answer ; nor shall the Fear of *Cavilers* discourage me in the Pursuit of the Discovery.

And when it is brought to Perfection, it shall not be hid, but exposed to the Tryal, as well as Censure of all the World ! In the Interim, I advise such as are subject to breed the Stone, to avoid all *Acids*, and whatever breeds Phlegm and Wind, and use such a *Regimen* as is soft and mucilaginous,

nous, for Reasons evident enough, if what is said above be duly consider'd: And with Respect to what is hinted before, concerning Diureticks immoderately given, I shall here farther add. That they may be used to such Excess as to melt down the Blood, break its Texture, and open the Pores of the Kidnies to such a Degree as to carry off all the *Serum*, which should convey Nourishment to the Parts, and then all *Poteables* run off immediately by Urine, which is *then* but very little tinctur'd with the Salts and Sulphur of the Blood, and produce a Diabetes.

But sometimes the said Salts and Sulphur go off with the *Serum*, by Urine, and precipitate it, and cause it to taste like Honey, *because* the Time for their Digestion and Union being so very small, the Sulphur being not dissolved, does so imprison the *saline* Particles, that they acquire only a sweetish Taste, so common in a Diabetes; as Litharge, and Coral mix'd with Vinegar, give *that* a sweet Taste after the same Manner.

It is possible also, that a *Diabetes* may proceed from the over oily Consistence of the Blood, which will not suffer it to incorporate with the *Chile*. Therefore to help such a Disorder, lixivial Salts are commended, and *more especially* such Medicines as abound with Volatile Salts, and that are of the Narcotick Tribe.

And if it proceeds from a Dissolution of the Blood, then soft thickening Things are to be administered, as *Gum. Tragacanth. Arabic. Rad. Simplit. Althea. Succinum. ter. Lemn. ter. Japan. &c.* and tho' this Disease does not properly fall under this Head of Diureticks, yet, for Brevities Sake, and to bring those Things that relate to the Urine under one View, I place them together, and, if not so very properly, according to common Method, yet very conveniently for the Reader; and that is what I study quite thro' this Work.

And

And here I shall add, That altho' Diureticks are not to be continued *too long*, for Reasons already given, yet if they are of the aperitive Kind; *especially*, they are however to be given in large Quantities, *whilst they are administred*, or they will not have the desired Success.

And now, to close up what I have to say on this Head, I shall endeavour to account for the Operation of *some* of the most-common Diureticks now in use; my Design being a continued *Brevity*, and only to give such useful Hints that may enable every Practitioner to know *why* he prescribes such particular Medicines, in *every* Case; and not to give a long and needless Catalogue of every Thing that is prescribed in *any*.

Of MILLEPEDES.

They abound with a nitrous Salt, which they take from the old Walls they feed on, and which acquires a greater Volatility when in our Bodies; their *Analisis* presents us with a volatile Salt, Oil, and Fleghm: They are diuretick and absterfivè, which makes them much used in Obstructions of the *Viscera*, and *particularly* in the Jaundice. Their absterfivè Qualities extend beyond the large Glands, *even so* as to scoure the smallest Passages, and keep the Nerves clean from viscous adhesions, that would foul their Springs; which makes them proper in all nervous Disorders, for they force their Way thro' all Manner of Obstructions. They are best given in Substance, or bruised and mix'd with White Wine. They may be taken 20 or 30 for a Dose: They precipitate the Salts of the Blood through the Kidnies, in larger Quantities than they would otherwise pass *that Way*, and therefore in all Defluxions of Rheum they make very great Revulsions by the Urinary Outlet.

Of CANTHARIDES.

BY *Analysis* they afford an extremely volatile, *acid*, Salt; a great deal of sharp, *fetid* Oil, with a Phlegm impregnated with volatile Salts, and a little Earth. They are prodigious Diureticks, but more by stimulating the Parts into such Motions as are necessary for the Protrusion forward, or ejection of the Urine, than by helping its Passage; and this is the Reason why they are so difficultly given, without bringing on the Stranguary. Therefore, whenever they are exhibited, the sensible Membranes ought to be guarded from their Velications by proper Broths and Emulsions. But there being Preparations and Simples enough of the Diuretick Family, without having recourse to such *dangerous* Helps, they should not be meddled with but upon great Urgency, and by skilful Hands: And the greatest Indication, where they are so very necessary and most safe to scour the Urinary Passages, by them is, when they are stopp'd with filth and viscous Matter, wash'd off from ulcerated Parts; and also in venereal Cases, where much Filth has been cast upon the Genital Parts, and in those Cases, if skilfully given, they are of great Use and Excellency; but indeed, the Art lies in the Knowledge *how* to give them; for according to *that*, they either do Mischief or Good. Some foolish People give them to stimulate to Venereal Intercourses, and often with sad Accidents, following such Administration; in which Case Camphore given, *ad gr. x. in Conf. Lujula*, every two Hours till the Symptoms abate, is one of the best of Remedies, *Ol Tartari per deliquium*, given in Milk, and often repeated, is accounted a Specifick

cifick; but ſuch unwary People, that either give them to others, or take them themſelves, are to know, that whatever Cantharides add to Venereal Vigour, is not by giving any better Abilities to *Perform*, but only by ſtimulating *thoſe Parts* which are the Seat of thoſe Deſires, and ſo create Inclinations without a Power to act; which proves a Torment and not a Pleaſure to them. The beſt Preparation, that I know, made from them, is, a Tincture to be found in Dr. *Quincies* Diſpenſatory, a Book, the beſt of its kind, that ever the World was obliged with.

Of MARSH-MALLOWS.

THEY afford a ſmooth emollient mucilage, which if taken inwardly, is not ſo directly diuretick as they become ſo, by guarding the Parts from corroſive Salts, and by ſheathing the ſharpeſs and acrimony of the Humours, and thereby ſuffer the Urine to paſs ſmoothly, and without Pain.

By their *Analysis* is produced a great deal of concrete volatile Salt, and acid Phlegm; ſome lixivious Salts, ſome Oil, and ſome Earth; by which compoſition and temperature of Parts, they are mucilaginous and emollient, and their Principles are ſo exactly mixed, that none of them ſeem to be Predominant over the reſt; their penetrating Salt being wrapt up in a mucilaginous Juice, it lubricates and relaxes the Paſſages, and precipitates the Fluids to their proper Outlets, all at the ſame time.

According to Dr. *Grew*, one pound of Mallows yields 3v. and 3ij. of Lixivious Salt, viz. The Twenty third part of the whole; ſo that this Plant, tho' of a very mild taſte, yet yields more Salt

Salt than *Mint* it self, a bitter Plant ; whereby it no longer seems strange, that a Plant of so soft a Taste should act as a Diuretick, and so evidently affect the Reins and Bladder. And whoever would suddenly and effectually carry off the most violent pain and heat of Urine in a *Gonorrhea*, and lets his Patient drink a Quart or Three Pints, (the more the better) in a Day, of a strong Decoction of Mallows boiled up with Liquorice, a little Barley, and a few Jujubes, and Sebestens (to make it more palatable) and in three or four Days taking, does not find his Expectations answered by desired Success, let him brand me for a Deceiver as long as he lives ; for I do faithfully assure him, I have used nothing else, *in that Case*, in all my Practice, for thirty Years, and it never failed me, *so much as Once*, as I am certain it never will any Man that *this* tries it.

Of Asparagus, or Sparrowgrafs.

THEY open the Urinous Principles, and bring them into Fermentation, and dispose the Urine to congeal ; the Roots are more Diuretick than the Tops, (as indeed, for the same Reason, most Roots are) *because* they have more of that Salt in them, from whence they derive that diuretick quality, than any part above Ground ; up to which it cannot ascend in such Plenty, as the Root receives it from the Earth.

Nitre, by its *Analysis*, presents us with a Salt like *Sal Armoniack*, and also a fix'd Salt like *Sal Gem* ; if we mix purified *Nitre* with Human Blood, it will hinder its coagulation ; it quenches Thirst, by fixing the exalted Sulphur of the Blood and Cholar, and so cramps the Freedom

of their Motion, and being compounded of a volatile Acid, and fix'd Alkali, dissolves the *Course Sulphur* of the Blood, and fixes its *Volatile Sulphur* at the same time, and thereby prevents irregular Fermentations.

Turpentine, yields an acid Phlegm, and much Oil, fill'd with volatile Urinous Salts, and that's the Reason it ferments so violently with Oil of Vitrol.

Juniper gives an acid Phlegm, much Oil, and some Urinous Spirits.

Parsly parts with a Flegm, Oil, Urinous Spirits, and a Concrete, volatile Salt.

Fennel affords Urinous Spirits, Oil, and acid Phlegm.

Saxifrage parts with an acid Flegm, Urinous Spirits, some Oil, and lixivious Salts.

Dandelion, Urinous Spirits, acid Phlegm, an Oil, and Earth.

Nettles, a Concrete, volatile Salt, sharp Spirits, an Oil, Earth, and lixivious Salt.

Burdock, a Concrete, volatile Salt, Oil, &c.

Pellitory, an acid Phlegm, some Oil, Urinous Spirits, Salts, and Earth.

And from this Method of *Analization*, we may make a Discovery what Medicines are *Diuretick*, and what not.

And here it may not be improper (it being our Design, to be very plain and intelligible in every thing we say) to explain, what we are to understand by the *Analysis* of a Medicine and what we mean by its *Principles*, distinguished by Spirit, Sulphur, or Oil, Salt, Phlegm, and Earth, *Terms* so frequently met with in Books of this Nature, and particularly in *this*, under this Head of *Diureticks*.

Analysis of a Medicine, is a Chymical Term, and is an unfolding of the Principles of any mixed Bodies, or a Resolution of Bodies into their Component Parts.

Matter

Matter is the universal Principle of all Things : and the *Common* matter of all mixed Bodies is the *same* ; differing only in Figure and Bulk, and what arises from thence. However, as Compound Bodies appear resolvable into Parts that seem *Homogeneous* and Simple ; these Parts, under their different Modifications, are commonly denominated *Principles* ; and are those five above named.

By *Spirit*, we understand the most subtile Parts of Bodies ; if it be *Volatile*, it first comes over the *Helme* ; but if *fix'd*, it follows the Phlegm ; and, properly speaking, *Volatile Spirits* are only a Solution of volatile Salts, in a small portion of Phlegm ; as *acid Spirits* are a Solution of acid Salts in the same Liquor. And the hot burning *Spirits* are a *mixture* of Sulphur, and very Volatile, Salt, in a little Phlegm.

By *Sulphur*, we mean all the intangling Parts of a mixed Body, especially such as flame upon the Fire ; it is the lightest parts of Bodies, below Spirits ; the volatile Sulphur follows the Spirits, and the coarser follows the volatile Salts. They are *Congregated* and fixed by *acid*, and attenuated and disunited by *lixivious* Salts.

From the different Proportions and Modifications of this Sulphur in Bodies, they receive their different Colours and Smells, it being a sort of a Cement to the other Principles ; and in Vegetables, where it most abounds, it preserves them intire all the Year.

By *Salt*, we understand what gives Bodies their *Solidity*, and is dissolvable in Water, and affects the Taste, in a *peculiar manner* ; there are three sorts of it of use in Medicine, *viz.* the *fixed*, *volatile*, and *essential* ; the fixed is made from the Ashes of Vegetables, dissolved in hot Water, filtred and evaporated till the Salt remains all at bottom, for that will not fly off by *Vapour*, and Salts made *thus*,

are called *lixivial Salts*. *Volatile Salt* is what passes over the *Helme with ease*, and some of them as easily fly away in the open Air; they are of *two sorts*; the one simply so called, and partakes of a *volatile Sulphur*, they ferment with Acids, and are plain *Alkali's*. The other, are impregnated with an *Acid*, and ferment with nothing of *that Nature*. They do not dissolve in the Air, nor have they a Taste so unpleasant as those of the sulphureous Tribe: Volatile Salt of Amber, &c. seems to be of this sort. The *essential Salt* is what we procure by Christalization from the Juice of Plants, and it is called *essential*, because no Force is made use of to produce it.

Now if any thing may be properly call'd a *Principle*, it is this of *Salt*; but then it must be of the *Fossile Kind*, or *Sal Gem*, which is a plain product of Nature, being washed into Springs and Rivers, by the help of Currents which run under Ground, from whence it is exhaled by the Sun, and then falls down again in Hail, Snow, and Dews, (for Rain Water partakes very little of it) and upon *this* its return, it fills the Surface of the Earth with its saline Parts, and mounts up again in the Juices of Vegetables, and into every other Thing that we are supplied with, as Food from the Earth, and by the Alteration it receives by its Mixture, with the Juices of Plants, it becomes *capable* (when in their Juice) of shooting into Christsals, and so becomes *Essential Salt*. But by the many Alterations it meets with in an animal Body, it is so divided as to pass for a volatile, quite different from its *Original*; And this may be owing to the *Sulphur*, which it wraps it self in, in its Passage thro' the Parts of the Animal where it lodged.

Phlegm, or Water, is the common *Diluter* of all solid Bodies, and notwithstanding what some great Men

Men may say, that it has no vertue beyond *Pump Water*, if distill'd from *inodorous* Vegetables; yet, to me, it remains a very great Question, whether it can be *so distilled* as to have no mixture of other Principles with it; I am sure, the most insipid, widely differs from Pump Water in Taste, and most of them have Tastes peculiar to themselves.

Earth, or *Caput Mortuum*, is that part of any Body which is left in the Furnace, after the other Principles are come off, it being incapable, either of being dissolved in the Furnace, or raised by Distillation.

N. B. The aforementioned Principles are not met with in Mettals, nor in some Minerals; as for the Salts, said to come from Lead, Steel, Pearl, Coral, &c. they are only foreign Salts, that have congealed some parts of their Substance.

Seeds and *Juices*, scarcely afford any volatile Salt, or *Spiritus Ardens*, unless first firmented. And the strongest Fire can neither fix nor volatilize any essential Salt, without Firmentation be included under that Name, as being a sort of natural Fire, made use of by Nature to exalt the Salts and Sulphurs of our Humours.

And here it may be worthy my Readers notice, what *Bartholine* quotes from *Borrichius*, concerning the Bladder, viz. if it be boiled in Acids, it turns to a Mucilage; if in salt Liquors it is thickned; if in *Oleous*, or in the Liquor of the *Alkali* Salts of Tartar, or Herbs burnt to Ashes, it is neither thickned, nor turns into a mucilage, but is burnt, as if it was laid on burning Coals, and may almost be crumbled to Powder; which I leave to Men of Leisure and Curiosity to make Tryal of; for, I confess, I never made the Experiment. It is a common thing, especially in Dropical Cases, to move Urine, by an infusion of Broom Ashes: But

as nothing can be got from them, except their *fixed Salt*, (and Dr. *Quincy* thinks, that Ashes of any other Vegetable will do as well) it is more neat, and preferable to take the fixed Salt in some proper Vehicle, and not meddle with the Ashes at all.

Of Pectoral Medicines.

Their Operation Explain'd.

TRUE Pulmonicks consist of such Particles, as being brought into the Blood, cannot be digested, subdued, and assimilated by it; and because they are *immiscible*, are presently (as Circulation brings them to the Place) thrown out of the *Pneumonic Arteries*, and so penetrating into the *tracheal Ducts*, have there, according to the Diversity of their Natures, a respective different Operation; thus Volatiles incide, open, stimulate, and Balsamicks discuss Tubercles, ease Distentions, and heal Ruptures, &c.

According to our Discoveries in Anatomy *hitherto*, nothing but meer Air can descend into the Lungs *directly* by the *Aspera Arteria*; no not a few Drops of Water, nor Spittle, tho' so near of kin to it, without great Pain, and manifest Danger of Suffocation, it being lined with a nervous Membrane of such *exquisite Sense*. Therefore it is absurd to think that any Medicine whatever (except Vapours and Fumes) can be sent *directly* to the Lungs. For, whatever the Remedies are that affect them most, (as Balsamicks and Volatiles do) they are conveyed to them in a *mediate Way only*:
For

for they do not slip down, directly by the *Trachea*, but being first conveyed into the circulating Blood, are thence *suffused* into the Pulmoniack Vessels, and their inmost Recesses, and Nature never knew, nor did Anatomists ever yet pretend to find out any other way; so far we go with the Multitude, and say as our Brethren do, because, for want of better Discoveries, we are forced to be silent, where we cannot in Judgment acquiesce; for, altho' by our best anatomical Inspections, we never could discover any other way for any thing to pass by *Urine*, any otherwise than by the Blood; yet it is possible there may be a nearer way from the Stomach and Intestines, by which Remedies may come intire, or but little altered, to the Reins and *Ureters*; for some have voided Oil, and others *Mercury*, with their Urine, and I remember to have seen the *Sculpture* of a Bodkin, (and the story well attested by our famous Brother Mr. Proby, Surgeon General of Ireland) swallowed by a Person, and so voided by the Bladder, and Dr. Fuller in his *Phar. Exte.* p. 294. gives us a story of an Artificer, his Patient at *Peterborough*, that upon taking his Balsamick, Nephritick mixture, brought away several Stones as big as Capers, by stool, which (says that ingenious Gentleman) *without doubt*, must come down by the *Cholar Passage* out of the Gall Bladder. And he says, p. 42. That it is a remarkable Observation of *Wallens*, that Butter and Cumminseed laid to the Breast may be tasted in the Mouth. And of *Bennett*, that upon a Person's eating Garlick, his Issue will smell of it, and grow sore and painful.

And of *Lower*, that if bruised Garlick be laid to the Feet the Breath will stink of it. And my Good Friend Dr. *Quincey* tells us, concerning Oil of *Turpentine*, that he has known a whole Company perceive

perceive it to alter the smell of their Urine, by sitting long in a Room newly painted, where the Colours were high charged with it; and that whole Families have found the same in a House new painted.

Now what has been may be, and if it be *thus* in one Case, (altho' we cannot account for it) why may it not be so in another? All Men, of any tolerable Practice must have observed, how momentarily some sort of Medicines have given Relief in the most terrible *Asthmas*, and how suddenly some particular sort of Food, that a Patient has inadvertently eat, has increased that Distemper; which was impossible (in point of time) if there was no other Passage to the Lungs, but by the common *Curricule* of the Blood.

All that can be said for it (that we know of) is this; as brisk stimulating Medicines, by pricking, tickling, and irritating the Fibres, without descending into the Lungs directly, excite a Cough, and by means of it *Exagitate* the Lungs, and shake the Humours out of them; so soft, oily, mucilaginous, incrassating Medicines, may obtund the Acrimony of the Humours, line the Parts with a *mucous*, make the Parts slippery, and so make *Excretion* easy, without coming at all at the Lungs; *but then*, it is not their Talent to fetch up any Thing that lies deep in the Chest; and therefore, when the Blood and habit of the Body is foul, and a load of thick Phlegm is to be brought out of the Lungs, such Medicines are pernicious, because they farther pollute the Blood with a heavy *Chile*, and so stuff up the Lungs with a greater *Colluvies* of *Recrements*.

But altho' stimulating Medicines, may, by raising a Cough shake the Lungs, and so pump out of the *Pneumonick Pipes* such Matter as lies loose and fluid,

fluid, yet they are in vain attempted, when a great load of Phlegm is deposited, and sticks fast in the *Bronchia*, and in most Vesicles; and indeed, their Use is not only *vain* but *hurtful* many times, because they raise a Cough, and tire out the Lungs to no purpose; and weaken their Tone without any Advantage. For there are, (in Propriety of Speech) no such things as Expectorators, except *Volatiles* and *Balsamicks*, which being conveyed into the circulating *Mass*, are thence suffused into the *Pneumonic* Vessels, and their inmost *Recesses*; and it's *only* such that have the Power to remove clammy Phlegm, and purulent Matter out of the *Bronchia* Vesicles, and crude Tubercles; so that when the Foundation of a true Consumption is laid in the Lungs, all other Pectorals and Cough Medicines are to be laid aside, and we are primarily and chiefly to persist in the use of *Volatiles* and *Balsamicks* to the end of the Cure, or we shall be sadly convinced of our Mistake by fatal Experience.

Things *actually* cold injure the Lungs, when they are tender and wounded; therefore, all Medicines, as much as possible, are to be drank warm, and so are all *Edibles* and *Potables*, and where Ulcers are feared, Emeticks are religiously to be shunn'd. *Fuller.*

Of BALSAMS.

Their Operation Explained.

BY Balsamicks seems to be comprehended all that is meant by softening, restoring, healing, and cleansing; to all which Intentions there seems this

this necessary, requisite in the Parts of all Bodies which are used therein, that they be soft, yielding, adhesive, and by their smallness, have a ready Disposition to Motion; it is not difficult to foresee how many Ends are to be answered, by a Medicine with all these Requisites, as likewise what a vast Progress they must take in many Instances, before they can arrive at the intended Scene of Action; for the seat of the Complaint is most commonly in the *Viscera*; now it is *certain*, that a Medicine cannot come at any of *these*, but by the common conveyance of the Blood; and how long from its being taken into the Stomach, it must be, before it can be prepared for, and goes its Circuit that way every one knows, who is but indifferently acquainted with the Animal Oeconomy; for altho' the Lungs are situated so near the Stomach, yet it must be a Work of many Hours before a Medicine can arrive there, after it is taken in by the Stomach, as it must pass the usual Course in the *Lacteals*, thro' all the *Meanders* of the Mesentery, and go up with the *Chyle* into the *Subclavian Vein*, and there fall into the Blood, before it can come near the place it is intended for, and *even then*, it has but the Chance of coming thither, only in such a Quantity as has a proportion to the whole, which comes into the Blood, equal to that which the *Pulmonary Artery* bears to all the other Arteries, which the Heart throws the Blood, into in every Pulsation. But in any particular Subdivision of this general Term, a Medicine given inwardly must pass through considerable Alterations before it can answer its end, even in the Stomach and Bowels, and therefore, nothing of this kind can be depended upon in a single or few Doses, but must be repeated until the animal Juices are sufficiently charged there-
with

with to afford a continual supply, whether to any particular part, or to the whole. *Quincy.*

Others say, that if Balsamicks are given with an Intention to digest, cleanse, heal, or cure the affected Part, they are a *meer Jest*, for how can the Part be healed, so long as the matter lodges in it, which hinders Agglutination? To suppose it, is a Contradiction, for altho' the Balsams outwardly applied, are useful Medicines to digest Ulcers, and Sores, and to dispose them for healing, yet we cannot from thence infer, that they will do so, if taken inwardly, by reason the *First* proceeds from their Application to the grieved Part, but the last must be done by altering and rectifying their Blood; between which two different Effects there is no manner of Agreement: We may as well expect, that because an *Escarotick* will eat off loose Flesh, if applied externally to the Part, therefore if taken inwardly, it will eat off a *Carcinosity*, or a *Pollipus*.

BUT, We have observed in the beginning of this Discourse of Pulmonicks, that *they* (of which Number Balsamicks are the Principal) are of such a Nature that they are *immiscible* with the Blood, and cannot be subdued nor assimilated by it; and if so, they may come *intire* to the Part, and there, as it were *electively*, adhere, heal, deterge, incarne, or what else is necessary to be done; for finding no aptness to receive it, nor no *similitude of Texture*, in any other Parts, it passes by them, and leaves nothing of its Substance any where, till it comes to the ulcerated or otherwise distemper'd Lungs, wherein it adheres, and leaves part of its Substance, which in a Measure, has the same Operation as if applied outwardly; and therefore, what is said above against this Doctrine, is very little to the purpose; only I am so far of
Dr.

Dr. Quincy's Opinion, that a *Balsamick* ought to be taken daily for a long time; but till it be proved that *Escharoticks*, are as *immiscible* with the Blood, as *Pulmonicks* are, or that they are as inoffensive there, as *they*, the Comparison deserves no notice.

And now we will close this Head with some Hints from the very ingenious Dr. *Wainwright*, in his Mechanical Account of the Non-naturals. In a Consumption, says he, all sweet Slimy, umcilaginous things are to be rejected; because they relax the *Solids*, and incrassate the *Fluids*, and fill the Stomach with a Glutinous Slime that palls the Appetite, weakens Digestion, and increases Thirst: But those Things that do Service, especially at the beginning, are such as contract the *Solids*, thin the *Fluids*, and at due Intervals, evacuate the viscid Matter, fix'd in the Glands; such as Emeticks, mild Stomachicks, moderate Exercise, particularly Riding, Blisters, and Diet of easy Digestion.

But as to Balsamicks in Consumptions, they are only useful as they are Stomachicks, or Diureticks, in which they may be exalted by acid, or saline Mixtures, but by themselves they are apt to pall the Appetite, and heat the Blood, and are contrary to the Indications of Cure: Taken in at the Mouth but very little of them enter into the Mass of Blood; and what so enters, is very much altered from what it was, when taken in at the Mouth, and all Balsams being more viscid than the Matter seperated in any of the Glands, it is impossible that Balsams should clear the Glands of their *Viscidities*; For the viscosity of the separated Matter, is as the number of *Plications*, in the complicated Artery, therefore to separate a Liquor more viscid than what is separated in any of the other Glands, as Balsams are, the Intestines which answer to the Artery, ought to be more complicated than any

Artery

Artery, of which a Gland is composed, whereas the *Testiculus Humanus*, is Fifty times more complicated, than the Intestines; for the Plications of the Intestines are not above Ninty six, and those of the *Testiculus Humanus* are Four thousand eight hundred; for *Bellini* informs us, that the length of the Complicated Artery, of the *Testiculus Humanus*, is Three hundred Ells, and the Altitude a Sixteenth of an Ell; therefore, the Number of Plications must be Four thousand eight hundred. Now as Ninty six is to Four thousand eight hundred, so One is to Fifty; therefore if Balsams were only of equal viscidty with the Matter sepe-
rated in the Testicles; the Intestines, in order to separate them, must be either Fifty times longer, that they might be Fifty times more Complicated, or the Balsams must be made Fifty times more Fluid, and so loose all their Balsamick Properties, so that Balsams, (as such) can never come at an Ulcer in the Lungs so as to heal it.

What has been observed before, may serve as an Answer to this, concerning the *immiscibility* of Pulmonicks with the Blood, and let this Mathematical *Hipotesis* be never so *finely Spun*, as indeed we cannot but say *this is*; yet there is no arguing against Experience, by which every one of any considerable Practice, (and my self amongst the rest) is able to refute this Doctrine, which tho' it may obtain with *meer Theorists*; must be exploded as false by every Practitioner; and what can be said of Balsams loosing their Virtues by circulation with the Blood, may much more be said of any other Medicine, and so by that way of reasoning, no Distemper, that had its seat in the Lungs could ever be cured at all; of which, happy Experience convinces us the Contrary.

But

But more distinctly to Explicate this Matter) Whatever is of use in Ulcers, or Wounds, or other Distempers of the Lungs, and particularly, Balsamicks; are not only of a Softening and adhesive Nature, but also by a peculiar Activity, or Disposition to Motion, joyn'd with a suitable configuration of Parts, are apt to wear off, and carry with them such Particles as they lay hold of, in their passage; and they are supposed both to cleanse and fill up, with new Flesh, all Ulcerations and Foulnesses: Now to do this, a Medicine must be supposed to maintain its primary Properties, until it arrives at the place of Action, as before we observed Balsamicks do; and there it does, what intitles it to the appellation of a *Vulnerary*. First, by it's adhesive quality which consists in, it's comparative largeness of Surface, and flexibility of it's component Parts; for by this, it readily falls, into contact *with*, and adheres *to*, the *Slough* of Ulcerous Exudations which by their loose situation, are Easily carried away, with the Medicine; and when the Matter, is so carried away; what was instrumental in this Office, will afterwards, stick to, the *carneous filaments*, until by *their Addition*; and the protrusion of proper Nourishment, *ab interno*, to the same place, the Waste is made up: Or in other words, *The Ulcer is healed*.

After the same manner, is the Operation of such Substances, to be accounted for, in External Application. By the warmth of their Parts, they rarify, and by their adhesive Nature, they join with and take off, along with them, in every dressing what is thrown upon the Place, to which they are apply'd, until a more convenient Matter, is supply'd; which it assists, in
:dhe-

adhereing to and incarning, the Eroding Cavities.

Qincy.

And now under this head, we may give the reason *why* Expectoration ceases, before Men die, &c. that is, when the Lungs become rotten, or so injur'd that they are unfit for Expectoration, the discharge from them, does not cease, for want of matter, (for the Lungs are commonly full of *that*,) but for want of Power, Strength or Ability, of the affected Parts, to pump any longer, up, *that filth*, which for many Years, the Party perform'd, so long as he had strength. But now Nature is quite tired out, and the Patient dies.

It was believed formerly, before the Circulation of the Blood was discovered, that in an *Empyema*, the matter was absorbed by the *Vena Sine pari*, and carried to the Emulgent Veins, where it was seperated, with the *Serum*, by the Kidnies: but tho' it is hard to Conceive, how the Mouths of *this Vein*, should open so wide, into the Cavity of the *Thorax* as to imbibe the Matter, and yet not, let forth the Blood, that is far more fluid; yet when the *Pus* is collected betwixt the *Pleura*, and intercostal Muscles, and that the tumor, does not suppurate, there is no *impossibility*, but that the intercostal Branches of the *Vena sine pari* may imbibe the Matter out of the Tumor, and carry it *that way*. But if ever *Pus* be imbibed, out of the Cavity of the *Thorax*, when floating upon the *Diaphragma*, the *Vena Phrenica*, are more likely to do it, than the *Vena sine pari*. Yet when such Matter is voided by Urine, (as it sometimes has been) it is probable that is absorbed, by *neither of these*, but rather by the *Vena Pulmonaria*, out of the Lungs when they apostemate.

But Dr. Gibson tells us, that the investing Membranes of the Lungs, have large Pores; which
P however

however, are so contrived that they will not admit of any thing to pass from within *outwards*, no not even Wind it self, altho' forced with a Pair of Bellows ; but on the contrary, they do (however) admit, even *Liquor*, to pass from without, *inwards*; so that when the Breast has been opened, to discharge the Matter in an *Empiema* (too thick to be absorbed by the Pores) and bitter Injections have been syringed into the *Thorax*, it has been observed, that part of such Injection, has been coughed up : And though some think that when ever *Pus* is coughed up, it was first bred in the Lungs themselves, yet I am of Opinion, that in an *Empiema*, when it is thin, *these Pores* may be so large as to imbibe it, even out of the Cavity of the Thorax, otherwise, I see not, how any labouring under an *Empiema*, should ever be cured without *tapping*; for of the two, I think *this* a far more probable way, to discharge the matter by, than that it should be imbibed by the Mouths of the Veins, gaping (as is supposed) either in the Superficies of the *Pleura*, or *Diaphragma*. *Anat. of Human Bodies Epitomised*, p. 318, 319.

So that the Reader has here the Substance of what can be said on both sides, and it is left to his Liberty to choose accordingly, which of the two he will embrace. I have only brought the Authority of some ingenious Men, who contradict one another, and give very good Reasons for what they say; and tho' it is very evident, that they cannot be *all* in the *Right*, yet it is no easy Matter to prove *which of them* is in the *Wrong*.

Of

Of HISTERICKS.

Their Operation Explained.

Histerical Affections, arise from too *tittilating*, or from too *uneasy* Sensations; the former proceed from that *irritation* of the Nerves, which the Composition, and Secretion of those Parts, have naturally subjected them unto; this, in some Constitutions, rising to that Degree, as to draw the whole *System* into disorder, and occasion variety of Simptoms, as divers sorts of Convulsions, and Species of Madness, which are therefore called *Furores Uterini*: Now these Disorders are best allayed by such Things as are the reverse of *Cordial*, and that are both in Smell and Taste very disagreeable and *fetid*; and seem to have their Operation by suffocating the Spirits, and damping their immoderate Sallies, whereby such stimulation ceases, and the Fibres return to their natural Tone and Motions; for, as what is gratefully to the Senses, gives an inexpressible Emotion to the five Nervous Filaments; so what is *fetid* and disagreeable, do quite destroy that *Emotion*. And as the former *Sort*, consists chiefly of fine volatile Parts, by which they are the fitter to penetrate the Nerves; so these are generally of a clammy viscous Texture, and thereby the fitter to invellope, and intangle that subtil Juice, whereby its Motion is much retarded, and the Fibres rendred less *Springy*.

In the *latter Case*, the uneasiness of the Burthen, when with Child, and sometimes the Disorders of the *Fetus*, brings the Womb, and gradually, the whole

whole nervous System into disorder ; which is not so well remedied by Medicine, as by endeavouring to contribute to the Ease, and gratifying the craving Desires of the Mother ; but the worst Mischief to these Parts is, from a Lodgment of some *Hetrogene* Matter upon their Glands, which inclines them to Cancerate ; or from an Obstruction of these Discharges, which at certain times, Nature requires to be made from those Parts ; in the *First* of these, all such things come to be deemed *Histericks*, which by their deterfive Nature, open these Glands, and carry off the obstructed Humours. In the *latter*, are employed such as either give a greater *Velocity* to the Blood, whereby it is inabled to break through the Capillaries, or so to *thin* it, that it is *thereby* fitted the easier to flow through, and make the Discharge required : And thus, whatever Medicine contributes to any of these ends (tho' as different in its Operation, as the Original Cause of the Disorder may differ,) they all acquire this general Name of *Histericks*.

Dr. -----, a very good Physician, and who for his Writings I honour, is very merry with an histeric Julip of his, whose Composition is this
Rx Aq; Ceras. Nigr. artemiss. pulegii aa. ℥i. Bryon comp. ℥iss. Tinct. Castor. ℥ss. Ol. Succini gutt. xxiv' facc. alb. ℥i. misce. Dose two or three Ounces.

From whence he takes occasion to talk so like a general of an Army, or a Man that has been used to Martial Discipline, (*at least*,) that I cannot help transcribing his Words, which are enough to put any Body out of the Vapours, that is never so immoderately *hipp'd*. “ This and other fætid Medicines (says he) take off Histerick Fits, by
 “ handling the Spirits *roughly*, and driving, and
 “ *dispersing* them. For when they grow *Mutinous*,
 “ and unequally dispersed, running in *tumultuous*
 “ *Crowds*,

“ *Croudes*, in some Places, and leaving others un-
 “ *garrison'd*, and so either *intermit* their Duty,
 “ within the *Precincts* of the Brain, or *Pracordia*,
 “ or else do it *perversely*; then the *best Course* is,
 “ to send such a *sterne Remedy* among them,
 “ as may use *severe Discipline*, and *Lash*, and
 “ *Scourge* them, till they are glad to leave their
 “ *Disorders*, and run to their proper *Posts*; and fall
 “ to their *Charge* again.

I am not Soldier enough to determine, whether nine Ounces of Simple Waters, and a few other better *Ingredients*, have the *Potency* and *Knack*, of disciplining the *Spirits*, after that wonderful manner, the Doctor talks of, having never been so happy as to make one *Campaign* amongst them; but if this *Julip* will do such feats (as I doubt not but it will, *because the Doctor says so*) I think no Mortal ought to be without the Knowledge of it; and I therefore must needs recommend it as a very clever thing, to all Splenetick Persons, and particularly to flatulent old Women, and all our bold Britons that dig for Honour in Trenches; whom I would (however) have leave out the *Ol. Succini*, because the Doctor says (very rightly) *Hoc autem remedium, non omnibus aeq. convenit, siquidem cernere est aliquas, quibus oleum succini ructus odiosos Excitat, & valde est ingratum. Probatum est.*

Musk exagitates the Blood after a potent manner, and very much refreshes the Spirits; now the smell of Musk causes swooning very often in Hypocondraick and Histerick Patients, but if taken in Substance (*Etmuller* says) that it is so far from being hurtful, that it effectually stops and restrains Histerick Fits, and it seems most agreeable, not where the Spirits are furiously exploded, upon account of their *Turgescence* and plenty, but where they fall into Confusion, and

are out of Order, because of their Want and Weakness.

Of SUDORIFFICKS, or DIAPHORETICKS.

Their Operation Explained.

Medicines, in a *strict Sense*, are called *Sudoriffick*, which procure Sweat ; and *Diaphoretick*, which cause *insensible* Transpiration. Sometimes *Diureticks* cause Sweat, and *Sudorifficks* cause Urine, because they are both pointed upon the Serofities of the Blood, and when the Serum finds an easy Outlet, *one way*, it does not strive to find a difficult one *another* ; so that in *Diarrhea's* and profuse Evacuations by Urine, Transpiration declines ; and on the contrary, as *that* rises, the *others* proportionably decrease.

Sudorifficks operate *as such*, by their Subtilty, whereby they disengage the Particles of the Blood, from one another, and separate the Humours to such a Degree, as that at length they are fine enough, to make their way through the Glands of the Skin ; or else they force out from the Surface what lay before ready for Perspiration (by contracting and bracing the Fibres) which is sometimes a great deal, and stagnates without such Helps ; of this sort are all Acids, and this is the Reason, why upon eating Vinegar, or such like Things, we sometimes sweat, and the same Effect has any sudden Fright, &c.

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The matter of *insensible* Transpiration is more subtle and delicate than that of Sweat; which is less fine, and more *serous*. Thus, burning Feavers are seldom accompanied with Sweats; *because*, the Blood *then* consisting of subtile Parts, and being in a rapid Motion, the small quantity of *Serum* which it injoys, is so agitated that it goes off by *insensible* Transpiration: And in the Declinings of an Ague Fit, the Patient sometimes sweats very profusely, tho' not at all in the height of it; the Reason of which is this; the Agitations being ended, the Parts adhere closely together, and being driven back by the Pores of the Skin, gather into Drops.

Sudorificks *sometimes* operate *more violently*, sometimes *less*; and sometimes *only* by *insensible* Transpiration, according to the present Disposition of the Blood, and Pores of the Glands.

Some Particles of our Blood will hardly be converted into Sweat, even by the greatest Agitation; like Oil, which tho' boiled very violently over a Fire, yet affords but little Vapour; yet when the Blood is so disposed, *so much* goes off by *insensible* Transpiration, that (according to *Sanctorius*,) we sometimes transpire more in one Day, than we evacuate by Stool in fifteen; the Truth of which I shall not here inquire into; only shall say, that the Matter voided by the Pores is often corrosive, being sharp Salts, separated in the Fermentation of the Humours, that produce Sweat, or *insensible* Transpiration; and for this Cause, when Transpiration is obstructed, and the Matter pent in, is full of fermenting Principles *only*, it creates *continual* Feavers; and if Corrosive, then *malignant* or *pestilential* ones. If the Matter be sulphureous and subtle, a *Stupor* or Inflammation accompanies the continual Feaver. When 'tis Acid and Gross, then *Phthisick* and

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and Consumption succeeds. When bitter, then it causes Bilious Loosnesses and Vomitings.

If 'tis Gross, and partakes but little of a corrosive Acidity, it gives Gout and Cholick, all which may serve to discover the Nature of the *different Diseases*, that call for *different Diaphoreticks*, and tho' all put the Humours into Motion, yet they do it by *different Methods*.

Some Sudorificks are full of volatile Salts; *these* by displaying their own Principles, give the Ethereal Matter an Opportunity of more than ordinary Action, and so produce this Motion; but these are improper in malignant or continual Feavers, unless there be a Disposition to Sweat, for otherwise they only stir up the Humours which are too compact, to let go their serous Part.

Those charged with volatile Salts are of use in all Diseases, where the Blood and *Lympha* move easily, or when the *Lympha* turns Acid, and congeals, as in Apoplexies, Palsies, Lethargies, Epilepsies, Suffocations of the Uterus, Convulsions, Scurvy, &c. but in Schirrous's of the Liver, and other *viscera*, Dropsies, Cachexies, &c. they are seldom prescribed.

Under this Head we reckon *Sal. Viperar. Cornu Cervi Sang. Human. Urine, Armoniac. Cran. Human. &c.*

But there are a vast number of Sudorificks that contain no volatile Salts at all, as *Ant. Diaphoret. occ. Cancror. Bez. Mineral. &c.* and these are of Use, where Gross Acids have coagulated the Blood, and so hinder a *Diaphoresis*, as in the Scurvy, Hypochondriack Melancholly, and all Obstructions arising from Acids: Here these *Alkali's* set loose the too close Union of the Blood, by imbibing the Acid that caused it, and so procure a more plentiful

ful Separation of the *Serum*, in the Cutaneous Glands. Sometimes these *Alkali's* may happen to ferment with the Acids they meet with in the Body, and by that means, stir up the Humours to throw out some part towards the Surface by Sweat.

These *Alkali's* are justly ordered, in the height of Continual Feavers, and in the hot Fits of Agues. But there are another sort of Sudorificks, which contain no volatile Salts, and yet cannot be given in with *Alkali's*, as *Rad. China. Lig. Guaic. Sarsaparil. Sassafr. Lig. Buxi. Bacc. Juniper. rad Petassit. Bardan. Bacc. Lauri. Ther. Ven. &c.* all these by virtue of their subtile Sulphur, put the Blood in Motion; intangle its Parts, and for a time imprison the Etherial Matter, whereby the Blood gathers Strength, sallies out impetuously, tosses about the Humours, and so occasions either a Sweat, or insensible Transpiration.

Sometimes Acids are joyned with the Sulphureous Medicines to help on the Motion, and dissolution of the Blood; for the more Massy the Parts that are in Motion be, with greater *Velocity* they move, and the longer continue their Motion. But where they are not of use, to be so joyned, they are Exhibited where the Mass of Blood is over run with Acids. For they put the Blood in Motion, &c. and intangle the Acids, and forbid their grateing upon the Parts, as they pass; and thus they are Successfully used in the Grand *Lues*, Gout, Leprosy, Scabs, Malignant Ulcers, Scrophulas, &c. And those which are possessed both of a Sulphur, and volatile Salt, are prescribed, in Pleurisies, and other inflammations, *because* the volatile Salt, dissolves the Sulphur, that occasion'd the Stagnation.

When

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When the Suppression of Sweat, causes an over plenty of *Bile*, in the Intestines; *there* Acids are happily joyned with Diaphoreticks, because they calm the Motions in the *primæ viæ*, whilst the volatile Alkali's, and Sulphur, drive on the Humour, to the Surface.

In an over rappid Motion of the Blood, Sweating is impeded, because the *Serum* is not allowed time Sufficient for *Percolation*, therefore *Opiates* are sometimes joyned with Sudorifficks: These Calm the Blood, and lessen it's Motion, and so cause the *Serum*, to move Softly, along the Surface of the Glands, of the Skin, and give it leisure to strain it self thro' them, and altho' *Narcoticks*, are never used *alone*, (on a sweating account,) yet they are *sometimes*, used in Collicks, and other great Pains, mix'd with volatile Salts, and Sulphureous Diaphoreticks: To the intent, that whilst *these* stir up the Blood, and Spirits, *they* may prevent the increase of Pain that might insue: For Sudorifficks, sometimes, only act the part, of alteratives and they begin to Change, the Disposition, of the Humours, before they come to Evacuate; and *therefore* they are to be frequently repeated, before we can hope for much Benefit by them: And it is adviseable, to begin with small Dosses at first, Especially if the Medicine has active Principles, least the Humours, should be too suddenly and violently Agitated.

All Sudorifficks are forbid, in Bloody vomitings, or Spittings, in *Dysenteria's*, in inflammations, or where the Blood is too much *fused* or Ferments too high. Nor must they be given to such as are Subject to Faintings, because they Agitate the Blood, before they dissolve it, and so may occasion *Sincope's*.

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And tho' Hipnoticks, are not *directly* Sudorifick, yet they *lull* the Senses, into a sweet Complacency, and *so* Compose the Spirits, that the Patient, lies still, and *thereby* a *Diaphoresis*, is the better induced.

Now all Medicines that promote Sweating, must do it either by their Subtilty, whereby they divide, and attenuate, the Humours, to such a Degree, that they become, fine enough, to escape, thro' such small Passages, as those of the Cutaneous Glands; or else by Contracting, and braceing, the Solids, which force out of the Extremities, what lay in readiness for Expulsion; and most Aromatick, warm and Subtile Bodies, have a tendency this way; *because* they cannot, but divide, and attenuate the Fluids, which make them go off, by the smaller Passages. But there is a difference, between *these*, and the common Aromaticks, for they act, as soon as ever, they Arive in the Stomach, and by the volatility, of their Parts divide, and thin, the Juices, in the *primæ viæ*, but go off in a great Measure, by some of the larger Discharges, whereas the *former* promise nothing, in their Composition, so active, as to be sensible, of until they have passed the last Comminution, or Digestion, in the Circulating Fluid, and *there*, they obtain, such a Resolution, as suits them, not only, for the Cutaneous Secretion, but also to break, and fuse, the Blood it self, thereby causing it's *Serous* Parts, to flow through, in great Plenty. And this will not appear so strange, if we consider the manifest difference, in our Food, *Analogous*, to what we assign here to Medicine, for some Parts of *that*, are sooner divided than others, in the Stomach, and *such* always afford the greatest Supply, to the larger, *Emunctories*, and go off, mostly by Urine, whilst *others* who have Subtilty
enough

enough, *only* to pass the *Lacteals* and get into the Blood, but are too Sollid, to undergoe, the last Commintion, but by a long circulation, bestow more matter, both for Nourishment and the finer Secretions; *therefore* those Substances, that obtain the appellation, of Sudorificks, are such as are capeable of being divided, into very fine parts, which do not Operate, until they are carryed, into the smallest Vessels, when their minuteness, and activity, fit them to pass and make way, for many others, to go off with them.

How sweating Medicines frequently terminate Feavers and throw off, by the Pores contagious Infections; and from thence are called Alexipharmicks, and Febrifuges, other Parts of this Treatise may Demonstrate: But it is sometimes done, by squeezing and contracting the Fibres, and *so* forcing thro' the Pores, what is in a readiness to pass, which often is a great deal in the Capillaries, that sometimes stagnates for want of such Shocks.

Of VESICATORIES.

Their Operation Explained.

THE manner how *Potential* Fires operate, is best found out by inquiring how *actual* Fire, does raise a Blister, of which it is observable, that the fiery Particles, being not too vehemently applied, penetrating the *Cuticula*, without solution of Unity enter under the *Cutis* it self; where the

Ends

Ends of the Blood-bringing Vessels, and of the Nerves, and nervous Fibres are terminated, and *there*, do variously twist together, these altering their Position, and perverting the Structure of the whole Texture of the Skin; insomuch, that from the Vessels being made angry, the watry Humour being mixed with fiery Particles, and therefore rejected both by the Blood and nervous Juice, is spued out in great Quantities.

Now this *Lympha*, because it cannot pass the *Cuticula* seperates it from the *Cutis*, and raises it, into that *Bladdery Form*, which we call a *Blister*: So *Cantharides*, being applied to a part, and heated by its *Effluvia's*, and so provoked to exert their *Poysonous Energy*, do abundantly dispatch out fiery Particles, which penetrate the *Cuticula*, without any *Laceration*; they are thrown upon the Skin, where they *first* act upon the Spirits, and *then* upon the *Humours*, and solid Parts; they dissolve the Humours, excite painful Convulsions of the *Fibres*; and the Humours being dissolved are constrained to sepe-
rate into Parts, and its watry Part, which is tainted by the venomous Particles of the *Cantharides* is rejected by the other Juice, and spued out, between the *Cutis* and *Cuticula*, and so raises a Blister.

Now the *serous* Juice cannot *always* bear all the sharp Parts of the Medicine back the same way they entred, but *sometimes* armed with some of its venomous Particles, flies back into the Mass of *Blood*, and *circulates* with it, and is ejected thro' other *Emunctories*, and offends some tender Channels, in its Passage; and amongst the rest, being seperated by the Kidnies, it hurts *them*, the neck of the Bladder, and urinary Passage, *corroding* the Parts, and so causing a Strangury, &c.

When

When they do not rise by a good Application, it shews that the Animal Spirits are dejected, or diminished, to a great Degree, and all the art of *Man cannot cause them to operate upon a dead Body*; from whence it is plain, that when they do operate, they operate on the *Spirits*; wherefore when a good vesicatory Plaster is applied, and no Blister rises; we have reason to fear that the Spirits are *exhausted*, and so consequently, *Death at hand*; yet this Rule is not without its Exceptions; for I have often known that where they have rose very well, the Patient has *died*; and where they *have not* rose at all he has *lived*; and done very well; the Cause, as I conceive, having been more from the badness of the Plaster, than any Fault in the Spirits; and I have known in the course of my Practice, where in a particular sort of Constitution, nothing upon Earth would raise a Blister, although applied *treble*, the common time generally made use of for such Purposes; and in a healthy Body too; but such Examples are not *Common*, nor shall one meet with three *such*, in ones whole life time; but *some* Bodies are more easy to have them raised, as *some* are more sensible of their Pain than *others*. But if the Plasters are compounded, *as I know how*; you shall not fail of a good Blister being raised in one Patient of a Thousand; nor shall one in twice that Number have a Stranguary upon their Application; although a thing so very Common, from the use of the common Blistering Plasters of the Shops; and when that happens, nothing gives speedier Relief than a Decoction of Mallows in Milk and Water; a thing, tho' very simple in its *Name*, yet very Efficacious in its Operation, as all those will happily find, that have so much Patience as to try it. And in the want of them half a Scruple of Camphir, in *Consf. Cynosbati vel Lujula*, given
once

once in four Hours, will help, and sometimes an Emulsion of the Cold Seeds, or new Milk drank in plenty will do the Business.

The Reason why Blisters have *only* Water and no Blood in them, is, because they being nearly allied to Causticks, raise a slight *Slough*, *Eschar*, or Crust, which pens up the Blood, and yet the Serum being thinner forces its Way through the Crust, but not being able to penetrate the *Cuticula*, lifts it up into a Blister.

They are of use in *Cutaneous* Diseases, in malignant Feavers, Vertigoes, Sopors, Defluxions of the Eyes, Nose, and Pallate, on the Lungs; Convulsions, Epilepsies, Apoplexies, Lethargies, Cachexies, and in some Dropsies, where redundancy of moisture gives rise to the Disease; also in *Oedematous* Tumours, Headaches, and malignant Feavers; their sharp Salts, effectually defeating the acid Salts, that often produces a Headach; and in Lethargies and Apoplexies, they stir up and retrieve the Sense of the Nerves, and rescue them from foreign Moisture, that oppresses them. They are reported likewise to be of use in the Gout, by *Eclipsing* the Pain, mortifying the acid Salts, and evacuating the sharp *Serum*, that oppresses the Part. But I have tryed them in this Distemper upon my self, and found no benefit, by their Use; but perhaps another may have better success.

In Malignant Feavers (by means of their volatile Parts) they conquer the foreign Ferments, and prepare the Pores for separating them from the Blood as we see Mortifications, and Ulcers sometimes cure such Feavers, by assisting the Flesh, to separate the malignant Ferments from the Skin.

They are hurtful in the Stone, Gravel, or Strangury, and in all Cases, where there is a want of *Serum*, and in a dry Habit.

It is necessary, that before their Application, the Part be well bathed, with a little warm Vinegar, in which some Salt is dissolved; and to let them lie on Twelve or Fourteen Hours, which will be long enough, if the Plaister is good for any thing.

Some People, out of a foolish Pity, for fear of hurting the Patient, when the Blister is drawn, *only* cut it, to let out the Water; and let the *Cuticula* remain loose till it will come off of its own Accord. But in doing this, the Patient is put to much more Pain; and not half the Discharge that ought to be, besides Ulcers are apt to be generated under the *Cuticula*, and *that* to adhere so fast to the Plaister, that it causes great Torment at every Dressing; in so much that some tender Bodies can hardly bear up under it.

Therefore, as soon as the Blister is well filled, or (if broke) you perceive it has done its Office; take off the vesicatory Plaster, if it comes off easily; if not, let it alone, and with a curious Pair of Scissors, and a light Hand, divide the Blister all round its Circumference, and gently and tenderly turn it back and quite off; which if artificially performed, will not cause much Pain; and *this way*, you will at every Dressing have a plentiful Discharge, without much hurting the Patient; because the Plenty of Matter, will not suffer the Plaster to stick very fast and close; but when it does, and that it comes off with Pain, rub a little *Basilicon* all over it, which will make it lie and come off easy; and lastly, apply Plasters of Diapalma to perfect the Cure; and he that takes this Method will never come under either Scandal or Blame in the Application of Vesicatories.

Of GLISTERS.

Their Operation Explained.

WHAT Cordials are to the Stomach, the same are Comforting Glisters, to the Guts; raising, an universal *Exultation* of the whole *Systasis* of the Spirits, defending the *Viscera*; and driving the *Radii*, of the *Miasm*, from the Center to the Circumference.

That Glisters may *Nourish*, appears from hence; that the *Colon* hath *Lacteals* (tho' not many) implanted in it.

And notwithstanding, the valve of the *Colon*, which hinders the corporal ascent of Glisters, any higher; yet they may possibly purge, not only, the *Rectum*, and *Colon*, but the upper Guts also: For the Peristaltick Motion, once begun, in the lower ones, may Easily be continued, successively up, even to the *Pylorus* it self.

Hildanus tells of a Woman, big with Child; that for six Weeks, was nourished, by nothing but Glisters: *Cent. 4. obs. 30.*

And *Borellus* saw one made Drunk by a Glister of Wine. *Cent. 1. obs. 56.*

A Glister made of an Ounce of the powder of the Cortex, and twenty Ounces of Water, and boiled to Eight Ounces, to which add, half an Ounce of *Diascordium*, and an Ounce of *Diacodium* repeated as often as it comes away, will commonly cure an Ague.

And one made of a Sheep's Inwards, or Trotters, boiled to a Jelly, and with the Yolks of Eggs,
Q and

and two or three Ounces of Canary; (if retained) will nourish the Patient very much.

But after taking a Glisten, let the Patient lie on his right Side, for so, the *Colon* will not be so much pressed upon, by the other Intestines, and by consequence, it may be retained, the longer.

Senertus and *Riverius* both, advise, when the Patient is so weak, that it is not safe, to give him *Opiates*, then it is both safe, and Effectual to give *Opium* and *Laudanum* in Glisters, but it is so ticklish a Point, that it is better let alone, because terrible Accidents may follow, and for my own part, I never saw such Practice.

URINE seems very proper in Glisters, being lately a Guest in the Body, and now supplieth, the place of *Bile*: For *Helmont* asserts, that the Salts of *Bile*, and of Urine, are the same, and both, most certainly *Nitrous*: But that the Urine, of *Wine bibbers*, is better than others, is an overgrown Error.

Terebinthinate Glisters, are helpful in the Stone, and Cholick not only, because it's Balsamick Particles, Comfort and Heal the Intestines, but also because, being taken up, by the Veins, they circulate with the Blood, and move Urine.

And *Etmuller* says, that Turpentine taken Glistenwise, in a Morning, and retained all Day, it gave the Urine, at Night the same Violet Odour, as if it had been taken by the Mouth, which renders it probable, that it diffuseth it's Particles, every where, and where it finds Morbifick Matter, degenerated into a Salt, or Sharpness, it reduceth it, to a fresh, and better *Crafsis*. But if it be given for the bettering the Juices, it must be frequently given, and in such small Quantities, as will not purge it self off: Which *Dr. Fuller* gives, as a new hint, in Phisick.

If

If ever you boil *Coloquintida* in a Glister, it must be tyed up, in a Rag, or it's fine dust that boiles off, will cause most intollerable gripings: Which is a note worth minding.

Dr. *Fuller* says, that some have dared to inject Glisters, actually cold, and some again condemn it, as *Male Practice*; but seeing the Stomach (which is of a far more Exquisite Sense and hath such a Simpathetick influence upon the whole *System* of the Spirits) can bear cold, yea even *Icey Draughts*, why should not the Guts, the same, or more? But I never made any Experiment of this Matter, and therefore only *propose*, but not *impose* it: And he says in another Place thus, (*Pharm. Extemp.* p. 186.) “ ’Twould make one smile and vex, at the same time, to see the silly Pride, and Maliginity, of some of our little pert Scorners, who tho’ they have neither read, seen, nor thought much in Physick, yet are continually setting up for Judges, and condemning all but their own dear selves, and Notions. Such *Insolents*, as these, I Expect, may fall severely upon me, for prescribing such quantities of Vinous Spirits, and chimical Oils, in Glisters, (*viz.* Brandy ʒii. and Oil of Anyseeds ʒss in one Glister.)

“ But were they to make due tryal of the same, there’s no doubt on’t, but Observation, would teach’em better, and happy success, would Command them, to applaud, what they now oppose. And tho’ this be not a vulgarly Establisht Practice, yet they may know, it’s not Mine only, nor a new one neither. For *Rondeletius* (borne above Two hundred years ago, p. 895.) cured a Woman of a grievous Cholicke fit, with a Glister of nothing but Wine, in which were infused Cinamon, Pepper, Ginger, and Grains of Paradise; and *Sanchez* (p. 123.) orders the

" same. Dr. *Stubbs* (*Philo Transact* No. 37. p. 271.)
 " relates that in the bilious Cholick, the *Jamaicans*
 " usually give Glifters of a Pint of Brandy, which
 " will make them as Drunk and Mad, as if they
 " had taken it at their Mouth. He tryed a quar-
 " ter of a Pint, in a Glifter on himself, which
 " made him, *not dead drunk, but raging mad, &c.*
 " Upon this Observation I would scarce ever,
 " exceed two or three Ounces of Brandy, and
 " I declare, *So far*, I have gone, with *Safety* and
 " *Success*, and as to Chymical Oils, I find *Duretus*
 " (*De morb. Internis, cap. 41. p. 410.*) commends
 " Oil of Juniper distill'd ℥ss , in Malvatick Wine,
 " and *Claudius Deodatus*, gives Malvatick Wine,
 " and Oil of Wallnuts *aa* ℥iii . *S. V.* ℥i . *ol. Juniperi,*
 " & *Rutæ aa* ℥ii . mix and give it very hot, &c.

And Concerning *Tobacco Glifters*, which some
 ignorant People are so fond of: I cannot forbear
 repeating, what the same Dr. *Fuller* quotes from
Etmuller, and a sad instance, from his own Know-
 ledge also. " *Clister ex decocto, tabaci, summe peri-*
 " *culofus Est, &c.* a Glifter of the Decoction, of
 " Tobacco, is a *most Extreemly dangerous thing*, for
 " I have known where there have followed (im-
 " mediately, as soon as ever it was injected) Sick-
 " ness, and anguish at Heart, Swouning, Vomit-
 " ting, Cold Sweats, Cadaverous Paleness, and
 " other the-like frightful Simptoms, and I my self
 " (who write this) had a Relation given me, of
 " one Mr. O. who from a Glifter of Tobacco, in-
 " fused in Sack, when he had a Cholick upon him;
 " fell presently, into horrid burning Pains, Con-
 " vulsions, Faintings, and so perished miserably
 " upon the spot, as 'twere all in flames.

As to Bitter, Worm Glifters, they are not to
 be given, till *Anthelminthicks*, have been first ta-
 ken by the Mouth, for some time, lest it force
 . them

them upwards: But if proper *Anthelminticks* are first administred, to make the Worms weak and languish, and drive them down into the lower Intestines, bitter Glisters may be given to good purpose.

But this Rule (like all others) has one Exception, for where a Person is troubled, with *Ascari-rides*, which have their seat near the *Anus*; bitter Glisters may at first be given successfully.

To give volatile Salts in Glisters, altho' it be a *new Practice*, yet they are Commended, in Epilep- tick Paroxismes, as well in Children, as grown Per- sons: And we have *Etmullers* Authority for it.

Strong forcible Glisters, are prescribed in Ap-oplexies and other great Disorders of the Head, not for any Extraordinary discharge that they make *immediately*. But by shakeing the nervous System, they promote their natural Vibrations, and throw off many adhesive superfluous Humours and so bring Relief.

But we must be cautious of using them in His- terical Cases *because* of the proximity of Parts, it not being possible to irritate the *Intestinum Rectum*, to any great Degree, but the *Uterus* will be so very much affected thereby, as to be thrown into very great Disorders, which may be very well worth observing.

And here I shall give a Note from Dr. *Quincy*, of Singular ingenuity related, in his *Pharmacopeia* p. 578. " Some Authors (says he) have very odd
" Conceits of wind, in the Bowells, and make
" strange distinctions, between what they call so,
" and Vapours, but such Confusion seems altoge-
" ther, to arise, for want of rightly understand-
" ing the *Sanctorian Perspiration*, for there is little
" else in all those Disorders supposed to proceed
" from wind, than a Perspirable Matter, flying
Q 3 off,

“ off, from some Parts, and Collecting together,
 “ in Vapours too gross to pass thro' some others,
 “ until by some means, it can be rarified thin e-
 “ nough, to pass, or some passage opened to give
 “ it vent.

“ The Distinction of a *nervous Cholick*, (many of
 “ which are those called *Histerical*) from *Humoral*,
 “ is with good Reason; not that it is from a *Gas*,
 “ or some imaginary spirituality as the *Meta-*
 “ *physical Helmont*, used to talk, but from *Spasmes*
 “ of the Nerves, owing to the same causes, which
 “ will draw them into Convulsion, in any other
 “ Part: And therefore are they always best treat-
 “ ed with Emollients, and such things as soften,
 “ and relax the Fibres or make them insensible,
 “ of those Vellications, which before convulsed
 “ them. And the same things, that answer this
 “ Intention, are likewise good, in bilious Chol-
 “ icks; *because* the same which relax the Fibres,
 “ sheath and blunt the Points, of the irritating
 “ Humours; and *because*, to this purpose, greater
 “ Quantities of Oils, and some ingredients which
 “ cannot well pass the stomach, are best conveyed
 “ to the Parts affected by a Glisten.

Of ACIDS, and ALKALI'S.

Their Operation Explain'd.

Riverius tells us, that Acids should never be
 omitted in *Bilious Feavers*; because *Bitters* are
 dulcified by *Acids*, insomuch that if they are given
 in

in an *intense Degree*, they'll destroy even the bitterness of *Colloquintida*, or *Aloes*; and when *Choler* is divested of its bitterness, it can do no harm.

Oil of Sulphur, and Vitriol, are proper in all putrid Feavers, but pernicious in a Pleurisy, *Perripneumonia*, coughing of Blood, inflammation of the Ventricle, Dysentery, bloody Urine, Ulcers of the Reins and Bladder, &c.

Acid diuretick Salts, fuse the Blood, and precipitate it into *Serum*, as some Liquors do, when poured upon Milk. And as in a sound Constitution, the Salt of the Blood is partly fixed, partly Nitrous, and partly volatile; and in some Scorbuticks, and in some Hydropicks, it is mostly fixed; in these Cases Diureticks consisting of an acid Salt, are successfully given; but in Rheumatick Affections, and in those Scurvies where the fixed Salt Particles of the Blood are carried up to a state of *Fluxion*, and the volatile depressed, *Acids* are apt to do more Harm than Good, because they farther pervert the Blood from an healthy *Crafsis*. But here, Medicines that consist of fixed and volatile Salts, are preferable.

Acids raise a *Diaphoresis*, by squeezing and contracting the *Fibres*, and so forcing thro' what is in a Readiness to pass in the Capillaries, or just upon the Surface. Thus, upon eating or drinking Vinegar or Lemmon Juice, People frequently Sweat.

A too liberal use of Nitrous Diureticks, is apt to spoil the tone of the Kidnies, and Juice of Lemmons in too large a Quantity will cause *Aphthæ*, and Excoriations in the Stomach, from whence come *Lienteria's*, &c. and much more may be said against a too plentiful use of Mineral Waters.

All Acids are to be kept from Copper and Brass, lest they take Impressions from it, and cause Vomiting, Sickness, &c.

Medicinal Earths are *Alkali's*, and precipitate *Bile*, as well as absorb *Acids*, and serous Juices; *From whence*, it cannot be absolutely concluded, that where-ever *Alkali's* do Good, an *Acid* did the Mischief; for common Experience assures us, that Medicinal Earths give Relief in divers Distempers, where an *Acid* is not, but *Bile* is the Cause: Being too much Excocted, it regurgitates, flies, foams and makes cruel Depredations; and these Earths mix in with it; and dissociate it, and restrain its preternatural *Exustuation*.

Generally speaking whenever there is an *Acid* offending in the Stomach or Intestines, *Alkalious Absorbents* take place. But, whether they operate beyond the *Prima Via* is a great doubt; for their dusty Particles spend their whole Force there, being utterly unfit to enter the *Lacteals*; or (if they could do that) to pass thro the Glands, to arrive at the remote habit of the Body; and therefore Children who abound with acid noxious Humours in the Bowels, receive Benefit by the *Testacea*, when grown People, more commonly fail of Help from them.

Some that are not acquainted with the *Analysis* of the Blood, and know no more of the Operation of a Medicine but Custom and Tradition; may wonder that in the same Distemper (or in Cases very near the same) Physicians prescribe both Acids and Alkali's. But I must acquaint such, that there are some Alkali's, and some Acids that will equally congeal the *Serum* of the Blood. As for Example, *Spir. Salis*, & *Vitrioli*, will do it, because of the Oily Parts that are in them; so also will, *Ol. Tartari per deliquium*, which is the strongest of fixed Alkali's; which evidently proceeds from the Sea Salt, lodged in the serous Part of the Blood; the acid Part of the Sea Salt, coagulating with the *Ol.*

Tartari

Tartari; and on the contrary, *Spir. Salis Armoniaci*, and other Volatiles preserve the Blood's *Fluidity*, and yet, notwithstanding sometimes (and generally) neither volatile Spirits, fixed Salts, nor Acids, are able to dissolve that tough sizzly Part of the Blood, *often found* in such as are afflicted with the *Phthisick*, Gout, Pleurisy, &c.

An acid has two distinguishing Properties. 1. It pricks the Tongue. 2. It ferments with *Alkali's*, but not always, for that happens according as the Pores of the *Alkali* are proportioned to the Points of the *Acids*; for it is by *this* that they get Entrance or not; and if they enter, a Ferment is made, otherwise there is none at all.

Acids dissolve *some* Substances, and congeal *others*; they rob all Sulphurs of their Motion, by their Points joining and intangling the oily hooked Points, and so put a stop to their *Fluidity*; thus *Spir. Nitri*, fixes *Ol. Olivar*, gathers the sulphureous Particles of its Milky Part, and turns them into Curd, and on the contrary, Alkaline Salts maintain the Dissolution, and liberty of the Sulphureous Parts.

Acids are of two sorts, *viz.* Volatile and Fixed. Some are Corrosive, *Spir. Salis, Spir. Vitrioli, &c.* Some are Styptick, as Allum. Some have a dry sharpness, as Citrons. Some a raw sharpness, as Verjuice; and some have a *softer* sharpness, as Vinegar, and all have their several Uses.

Acids are apt to sting the Nerves, and so are offensive to them and the Brain; they also fix the Humours, and thereby prevent the due Filtration of the Spirits.

They outwardly stop Hemorrhages, by congealing the running Current, and by contracting the Fibres, and so shut up the Passages: And inwardly taken, they do it, by thickening it; and fixing its exalted Sulphur, and thereby abate its extravagant Ferment,

250 . Of Acids, and Alkali's.

Ferment, and for this Reason it is, that they are applied with Success in the beginning of Inflammations and Contusions; that is, because they lessen the Motion of the Firment, fixing the exalted Sulphur of the Parts, and soliciting the Spirits to possess the Fibres and fortify them. *But* when the Inflammation is far advanced, and the Matter has disabled the Fibres, by a Lodgment in them, *then* Acids are injurious, *because* they thicken the extravasated Matter, and prevent Transpiration.

Saline things are a Composition of *Acids* and *Alkali's*; thus *Spir. Salis*, poured out upon *Sal Tartari*, make a true Sea Salt; and tho' Sea Salts possess an Acid, yet what an Acid *dissolves*, they *precipitate*, and hinder, those Coagulations that Acids are apt to occasion; and *Alkaline things* being very *Porous*, more easily melt in the Air than those that are *Saline*; and *volatile Alkali's* precipitate the Solution of Corrosive Sublimate, but the *Saline's* do not alter it at all, being neither apt to firment, nor to raise any sensible Motion, unless richly stored with *Alkali's*; whereas, the solution of *Mercury* is nothing but Water, impregnated with Acids; bearing up the mercurial Particles; the *Alkaline, volatile Salts* either sucking up, or mortifying the *Acid*, and so disintangle the *Mercury* from it, and then it subsides to the bottom.

The saltish Salts have an equal Influence upon Sulphur and Water, they are the true Cement of Oil and Phlegm, and by uniting the Parts of mixed Bodies, preserve them from Corruption, for it is the incoherence of Parts that makes way for *that*.

Of

Of CATARRHS, and RHEUMES.

Their Seat accounted for.

Fernelius saith, besides *Serum* within the *Cranium*, there's other Excrements gathered in the external Parts of the Head, especially under the *Cutis* of the Vertex, where the Vessels have their Extremities; which when they grow turgid, with too much *Serum* or other Humour, they shed forth under the Skin that which they cannot carry off, and *there* it remains, because the thickness and looseness of the *Cutis* permits it not to evaporate; and there's sometimes so great a *Collection* here, that it causeth a soft swelling, that manifestly heaves up the *Pericranium* from the *Cranium*. This is assuredly the *source*, this the *matter* of all external Distillation, which it is very strange none of the Antients observed. Hence Rheumes fall into the Eyes, Cheeks, Teeth, Neck, Shoulder-Blades, Sides, Back, Loyns, Hips, Thighs, and all the Joynts, and this is certainly the Foundation of every external Pain, particularly in a Catarrh, the Matter does not really flow down, out of the Brain, but the original of that Defluxion is in the *Vertex*, as is hinted before, where the Humour is collected on the out side of the *Cranium*, under the Skin, and *thence* distils thro' the *Pericranium* into the *adhereing Membrane*, and falls down into the Eyes, Nose, Teeth, *Uvula*, &c. nor will this seem strange, if we consider that there are Passages open enough for the Blood it self (tho' much thicker) when thereabouts it is *suffused* into the Parts,

Parts, by reason of a Contusion and Rupture of the Vessels, so true is the Opinion of *Tulpius*, that in Wounds of the Head, the Blood which is commonly seen to run out at the Ear, descends from the *Vertex*, between the *Cranium* and *Pericranium*, and so entering the space that is between the *Os Parietale* and *Petrosum* goes on, and strains it self (as by a Sieve) into the Auditory Passage.

And here, altho' local Medicines may take place, if the Distemper be outward (as in *Rheumes*, &c.) yet if it lies wholly inward, and the *Meninges* and Brain be affected, one can hardly conceive it possible for external Applications to operate through the *Cranium* to them.

In Catarrhs, all *strong* Catharticks are to be avoided, *because* they *not only* debilitate Nature, *but also* increase the *Colliquation* and raise the Fever.

Of WIND, and FLATUS.

WIND is caused by bad Digestion, or windy Diet, or both; its no where but in the Cavity of the Stomach or Intestines, and is known by little Sicknesses, Yawnings, Drowsinesses, &c. and which either finds vent upwards, or passing downwards, rumbles about in the Guts, and so breaks off.

Flatus is an invisible, impalpable, and *incoercible* Spirit, and is produced by an acrid glandulous Juice, viciously fermenting, with a crude viscidious Matter, and not so much in the Intestines as in their Membranes, the Mesentery, and uttermost *Loculi* of the Body, where the Arteries have
thrown

thrown out and deposited it, and troubles the Patient most when the Body is empty, and is what we mean by *Hypochondriack* and *Histerick* Affections, Vapours and Spleen Pains.

Things that discuss Wind differ not from such as incide Phlegm, for Wind is generated by Conquassation of Phlegm, after the manner we see Whites of Eggs beat up, till they all become Froth and Bubbles; therefore, those Things that correct the Viscidity of the Phlegm, prevent and destroy Wind.

Fetids will repress *Vapours* in *Women*, but will seldom touch upon the *Flatus* in *Men*. Why then must they be confusedly jumbled together and accounted the same? and all their Difference to be only in Degree? Why do we not rather let them be different both as to *Place* and *Essence*? And then why do we not study out, and settle their particular Remedies and Methods of Cure. *Fuller*.

Of GARGLES. *Their Ratio.*

IF very thick and viscous Matter be to be fetch'd out of the Glands, then *Spir. Sal. Armon.* and all acrious irritating spiritous Gargles are to be made use of, viz.

Rx aq. hissopi ℥x. S. V. rect. ℥i. Spir. Cochlear 3℔
Spir. Sal Armon. Div. Spir. Castor. ℥ii. pulv. rad. piperethri ℥i. Mellis ℥iv. MS. & usurpetur frigidè.

Dr. Fuller says, no body need fear increasing the Inflammation by such a brisk Medicine, where clammy Phlegm is impacted in the spongy Parts, and dams up the Blood, and causing inflammatory Inun-

Inundations. And therefore (says he) most certain it is, that the true Cure of a Quinsey mainly consists in the *Eliqution* and *Eduction* of that same Stagnating and obstructing Phlegm.

If the Matter be not so very viscous, and yet stagnates, because of the fungous Laxity of the Glands, austere, astringing Gargles will do the Work, viz. *Rx Cort. prunellor. silvest. ℥ii. Coq. in aq. font. ℔iij. Col. ℥xxiv. dissol. allum. Div. aceti ℥ii. mel. ros. ℥vi. MS.*

It astringes and squeezeth close the salival Glands when they are stuff'd, and loose their tone, and renders them capable to assist the afflux of more Phlegm.

If Slime and Filth line the Mouth and Tongue, Detergents and Acids are most proper: As *Rx Succ. pomor. agrestium ℥xii. Syr. E. rubo Idæo ℥iv. MS.*

If the Parts be excoriated, tender, smarting, and dry; emollients and mucilaginous Gargarisms are best. *Rx Rad. althea. liquerit. Hord. perlat. aa. ℥i. furfuris macri in nod. ligat. Mi. cort intern ulmi, gum arab. aa. ℥℔ sic. No. viii. Coq. in aq. font. ℔iij. Col. ℥xxviii. dissol. Syr. jujub. althea aa. ℥ii. loboc. san. ℥℔ ms.*

If the muscular parts are but little inflamed, and no greater afflux of Blood than at first, let your Gargles be made of Refrigerants and Repellents. *Rx Fol. vitis. herb. Salvia. veronic. sam. pentaphyl. ocul. rubi aa. ℥℔ coq. in aq. font. ℔iij col adde allum ℥i℔ aceti Mellis aa. ℥ii. coq. iterum & despuma.*

But if the muscular Parts be much inflamed from the Ebullition of the Blood, and the Inflammation fixed, Emollients and Coolers will be of use. *Rx Aq. plant. Sperm. Ranar. flor. Samb. aa. ℥iv. aq. ros. rub. ℥ii. alb. ovor. (in aquam agitando redact) No. iv. succ. alb. ℥i. ms.*

A Gargle in a Quinsy.

℞ *Herb. aquileg. Mii. cort intern. Ulmi ʒi. fung. samb. glycyrr. aa. ʒβ coq. in aq. font. ʒiijβ Col. ʒxxvi. dissolv. sal. armon. ʒii. Syr. E. Rub. Ideo. mel Rosar. aa. ʒiii. ms.*

A Gargle in the Small Pox.

℞ *Hord. perlat. rad. glycyrrh aa. ʒβ rad. althea, ʒi. sic. No. xii. fung. samb. Mi. Coq. in aq. font. ʒiijβ Col. ʒxxviii. dissolv. Oximel. simpl. & mel. Ros. aa. ʒii. ms.*

A Gargle for the *Uvula*.

℞ *Herb. aquileg. Miv. flor. ros. Rub. sicc. balaust. aa. Mβ. piperis longi Div. mirrhæ ʒii. Coq. in aq. font. ʒiij. & vin. alb. ʒβ Col. ʒxxvi. adde S. V. syr. moror. & E. Rubo Ideo aa. ʒii. ms.*

Allum, and such like *austere* things (Dr. Fuller says) do by no means shut up the salival Passages, or hinder the issuing out of the *Saliva*, altho' the Affirmative is commonly believed by most ; but on the contrary, by squeezing the Glands into less compass, it does much promote the same, which will evidently appear to any one that makes Observation.

Rules for applying every Medicine from Sennertus.

1. Let them not be either intensely hot or cold, but luke-warm.
2. Put in no new Medicine, till the Ear be cleared from all the Remains of the former.
3. A few Drops at a time are enough.
4. After

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4. After putting any thing into the Ear, let the Patient lie on the well Ear, and *masticate*, that it may the better penetrate.

5. Let the Medicines be neither too Unctuous, nor viscous.

6. In all Deafnesses, let the Head be carefully roborated, both by external and internal Medicines. And *Wedelius* adds,

7. *Fumes* are best for Exsiccation; *Humid Vapours* for mollifying and easing: *Oleose* and *Spiritous*. Things for discussing and roborating.

Of Aperients, and Attenuators.

Their Operation Explained.

THESE Medicines either by rarifying, and agitating the Particles of the Blood and Humours without Fermentation, put them in Motion, and preserve their liquid Form, or else are such, as imbibe the Acids, that congeal them. Sometimes they prove Diaphoretick, and sometimes Diuretick.

Some are aperient by accident, and instead of penetrating the Blood incounter the *Acids* in the *Prima Via*, and so attenuate the *Bile*, *succus pancreaticus*, *Chile*, &c. without any remarkable ferment or rarefaction, these only suck up the *Acids* there, and so render the *Chile* more liquid, and the *Blood* by Consequence; of this sort are all the *Testacea*. *Bol. ver. occ. Cancror. succinum, Coral, terr. sigill. Ras. CC Eboris, &c.*

There

There are others, whose Parts are not so gross, but are more apt to melt, and penetrate beyond the first passages into the Blood without any great fermentation, these are what are happily Exhibited, in all Obstructions of the Bowels, Dropsies, Schirrus's of the Liver and Spleen, and in all Cases where the Liquidity of the Blood is hurt by Exotick Ferments: And in the Number of these are lixivial Salts, and such things as are both lixivious and oilie; these dissolve easily, and are very penetrating.

And there are another sort, highly replete with volatile, and aromatick Parts, which cause all the Humours to ferment, and put the Blood and Spirits into violent Fermentations: They are of use in the Plague, obstructions of the Nerves, and Soporose Distempers. These are either *volatile Salts*, or such as are *Sulphureous Volatiles*. As *Ther. venet. aq. therical. tinct. Salis Tart. myrrh. Cast. Decoct. Guaci. Rad. chelidon. Curcumæ, &c.* The two last are very great *Aperients*; the first of them abounds in lixivious, and volatile Salts and Oil, and has some Earth and Phlegm; And the last has the like Principles, but less of volatile Salts, and it's Principles more Compact.

Aperitives ought to be such, as are able by the Subtilty of their Particles, and agreeable Warmth to dissolve Concretions, supple the Rigid Fibres droppilate the internal Passages, relax the tense *Cutis* and set open the Pores, that were Closed, which when accomplished, the Blood whirls round and absorbs the thick *Liquamen*, into it's Channels, and the Pores give way, for the thinner part to fly off by a *Diaphoresis*, and therefore are helpful, in all Tumors, for they are caused by an obstruction, some where or other, which like

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a Dana

a *Dam* stops the Course, of the influent Humours, and so makes an Inundation.

Of Incrassateing Medicines.

Their Operation Explained.

THESE are such as by an immediate mixture of their Parts with the Blood, incrassate, or thicken it; after too great a Tenuity, or Fermentation, which they do by checking the Ferments, and so lessening it's Motion, and of course, the quantity of it's seperate Humours, for when the Parts of the Blood, are more Compact, those Humours cannot be strained out, so largely as before; as is seen, both by the Sweat and Urine, which is *observably* less, in Persons, after taking incrassating Medicines.

They are improper for such as are subject to violent Heats, and have not a free Perspiration, whose Pores are very Compact, and in melancholy Habits. But they are of great use where the Blood is too much attenuated, and where Transpiration is apt to be Excessive.

Incrassating Remedies replete with tenacious Parts, are of use when the Blood is over charged with sharp Salts, as in hectick Feavers, Phthisicks, &c. because they smooth, the Points of all the sharp Salts they meet with: Which Salts having run down the oilie Parts of the Blood, Acids are not so proper to repair.

When

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When volatile Acids are the Cause of the dissolution of the Blood, we give those Alkali's, that upon other Accounts are said to dissolve the Blood, viz. *occ. Cancror. coral. facc. Saturni, &c.*

Narcoticks have the first place amongst the In-crassating Medicines, as Opium, *Cap. papav. Sem. Hyosciami, &c.* and all that are viscous, as *Gum Tragacanth.* (which is a true Alkali) and all that are mucilaginous. And to the number, we may add, all such as are fill'd with volatile Salts and Oils; and of a temperate Nature, as Gellies, or Decoc-tions, of Hartshorn, Ivory, Broath of Crabbs, Craw-Fish, Lobsters and such like.

Of SUBPLANTALIA, or Feet MEDICINES.

Their Operation Explained.

THEIR Operation is by impressing, a brisk touch on the Soles; the *Cutis* there, being Exquisitely sensible, the force of the Medicine, is *thence* derived on, to the minute Fibres, Mem-branes, Nerves, Brain, and Spirits, and so very readily, to the Heart Arteries and Blood; and of this kind, are two sorts, 1. Those that are by nature quieting, and made *actually* Hot, as Lo-tions of Poppy Seeds, &c. And they are used when the Blood boiles high, circulates unequally, and rusheth violently, into the superior Parts, and causes Watching, Burning, Headach, &c.

R 2

2. Those

2. Those that are stimulating, as the Cataplasme, of Herrings, Radishes, &c. And they are of use, when the Spirits are oppress'd (but not Exhausted) and grow stupid, &c. as in soporose Cases.

They act (not upon the Feet primarily but) upon the Spirits by an *immediate Contact*, of Particles, sent off, into the Blood, and they are also of two sorts, 1. Such as rouse up and Expand, as Treacle, Euphorbium, Mustard, &c. And these are indicated, where the Spirits are spent, and Extreemly languish, even *so*, as not to make good their Continuity, and Expansion, but fall into Startings, Tremblings, Twitchings and Swoonings. 2. Such as Pacify, the intraged Spirits, as Pidgeons slit open alive, and Lambs Lungs apply'd to the Feet warm, as they come from the Animal, and these are proper, in *pertinacious Watchings*, Phrensies, Convulsions in Feavers, &c.

What Dr. *Fuller* says in this Case is very remarkable, " In hot raging Estuating Feavers, when
 " the acrid fervent, boiling Blood, gets an head,
 " and tumultuously breaks in, upon the Brain,
 " and *accends* the Spirits and drives them into
 " Distraction, and Fury; thereby Exciteing in
 " the Head, Ardor, Hissing, Humming, Crack-
 " ling, unexplicable Conturbation, frightful Fan-
 " cies, Terror, Phrensy, Delirium and Watch-
 " ing; I say in such a case, a *Pedilave* that is *poten-*
 " *tially* cold, and *actually* hot useth to bring great
 " Relief; *forasmuch* as it inclines the Motion of
 " the Blood *downwards* into the inferior Parts;
 " and at the same time does not inkindle, nor
 " flutter it, e'er the more, *but* on the *Contrary*,
 " refrigerates and quiets it.

" For you must know first, there are two perfectly distinct, great provincial Circles, of the
 " Blood, *one* by the ascending Artery, through
 " the

“ the Parts Scituate *above* the Heart: And the
 “ *other* by the descending Artery, thro’ the Parts
 “ *below*; Secondly that by how much the more
 “ rapidly, and with greater Stream, the Blood
 “ rusheth thro’ the Inferior Province, by so much
 “ the more *placidity*, and with less Current, (of
 “ necessity) will it flow through the opposite
 “ Superior Province, and so on the contrary, and
 “ upon *this Foundation*, is grounded the *rational*
 “ Doctrine of *Universal Revulsion*.

“ But here it’s of great concern to observe that
 “ in such Feavers as are *Mali moris*, where the
 “ Blood doth not boil, and rage, and rush vio-
 “ lently; but rather is too sluggish and dead and
 “ scarce irrigates and vivifies the Brain, Nerves
 “ and Muscles enough. And also where the po-
 “ verty, Weakness, broken Ranks, desertion,
 “ and dissipation of the Spirits, produce watch-
 “ ings frenzy, and twitchings: In such case, (I
 “ say) *lotion of the Feet*, is found utterly pernici-
 “ ous; because by how much the more, it increa-
 “ ses the *Inferior Circle*, just so much the more
 “ doth it diminish, *the Superior*, and so conse-
 “ quently defrauds the Brain, of Blood and Spi-
 “ rits, which failed too much, for want of them,
 “ before *Fullers Pharm.* p. 281.

It has been frequently known, that *Epicarpia*,
 or Applications to the Wrists, have cured Agues,
 as well as others, to the Soles of the Feet, have in-
 duced sleep; and disorders of the Head, altho’
 very remote from the Feet, are hereby mitigated,
 and helped; on account of the Communication
 that there is between these Parts, as well as others,
 both by means of the Blood Vessels, and Nervous
Fibrillæ.

As to *Pedilaves*, they sometimes will procure
 rest, when *Laudanum* will do nothing to the Pur-

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pose; and this it does, either by the relaxing Property, and humidity of the Bath or Wash; thereby taking off the over *Tension* of the *Fibres*, (which is the Cause of want of Rest) or from the narcotick Particles of the Composition of the *Pedilave*, getting into the Blood, and thence into the Brain, subduing and shackeling the animal Spirits, and prevents their irregular Sallies; so procuring rest.

Rolfincius tells us, *Dissert. Anat.* 1034. that what Blood remains, after the Nutrition of the Skin, may be carried back by the *Cutaneous Veins*, to the larger Branches, and Trunk of the *Cava*, whereby the Virtues of the *Epicarpia*, transmitting their Atoms thro' the Pores of the Skin, may not only be communicated to the Blood, (and so abate the heat of a Fever) but to the Heart it self.

And *Silvius*, *Prax. l. 3. c. 3.* condemns all those, who reject the use of Ointments, Plasters, and Linements, as if it was impossible that they could penetrate through the containing Membranes of the *Abdomen*: which, let it seem ever so improbable, daily Experience witnesseth to the Truth of the Fact; which sufficiently shews their Penetrability, and it is not hard to conceive *how* they do it. *viz.* By the Pores of the Skin, from whom there is a Passage to the Vessels, and so to the Heart for since all Parts of the Body are made up of divers Particles, and therefore of Atoms joyned together, it is probable, that they are not so exactly put together, but that there is every where, a Passage through them, for *Fluid*, and more especially for volatile Bodies; for there is no part, but by Good Glasses, may be observed to be *Pervious*, and *Hippocrates* pronounced it to be so: And if external Applications had not internal Effects, how is it that *Schirruses* of the Liver and Spleen, have been often undeniably cured, by Plasters applied to their Regions

Regions; or Agues, by Plaisters of *Cinnabar* to the Stomach?

We all know that Mercurial Plaisters, are with good Success applied to venereal Tophs and Nodes, and Ointments prepared from it will Salivate, which is performed by the Pores, and so mixed, and circulated with the Blood; and why one Plaster should penetrate the Pores, (or Unguent should pass that way) and not another, is not at present very evident to my Understanding, there are Instances, (and not very remote neither) of Children that have lost their Lives by an over Purgation, from rubbing some sort of Ointment on their Navels in order to kill Worms; whose Particles entering the Pores, and intangling themselves in the nervous *Fibrilla* of the *Viscera*, incessantly provoked the Bowels to shake them off, and not being able, nor no relief from proper Medicines; first a Convulsion came on, and Death soon followed; see this Case in the Appendix to *Turner*, *De Morb. Cutaneis*, p. 348.

Of *Acute Diseases*.

Acute Distempers, especially those attended with Pain, generally proceed, either from a too great Contraction of the *Sollids*, too violent Motion in the *Fluids*, or from *both* together.

The general Cause of *Acute Feavers*, is an Obstruction or contraction of the Glands, whereby the quantity of Blood, and *Liquidum nervorum* is increased.

Pain, which is a *Stimulus*, makes more strong and dense Vibrations of the solid Parts, and so divides the Blood into *smaller Parts*, which must *therefore* take up more room. For the Surfaces of Bodies, upon their Division, do not decrease so fast, as their *Solidities*; *these* being in a *Triplicate*, as *those* are in a *Duplicate Proportion* to their Diameters.

When the Heart contracts more strongly, or more frequently, or both; the Blood moves more quick, or slowly thro' the Arteries; for the Dilation of the Arteries, or Pulse, keeps time with the Contraction of the Heart, *therefore*, when the celerity of the Blood is greater, the Pulse is quicker and stronger.

The heat of an Animal is in compound Proportion, to his quantity of Blood, and the *celerity* of its Motion. Its Motion being very quick, and the Blood hot, its thin Parts will be evaporated, and the remainder more solid than in a natural State, and the *grosser* part being retained, in *this* Condition, it *thereby*, becomes more *viscid*; and its *viscosity* is increased by its Heat; for if you apply to it a much greater degree of Heat than will boil Water, it will turn its *Serum* into a Jelly.

The Heat of a Man's Skin, whose Pulse beats Sixty times in a Minute, is to the heat of boiling Water, as sixteen to fifty two, as appears by the *Thermometer*; so that boiling Water is but little more than three times as hot, as the Blood of an healthy Man. Now, if the heat of the Blood should increase, in proportion to the frequency of the Pulse; then a Man whose Pulse beats One hundred ninty five Strokes in a Minute would be as hot as boiling Water; and it's common for a Pulse in a high Fever, to beat One hundred and twenty Strokes in a Minute: Hence the *sizyness*

of

of Blood in Pleurifies, and other inflammatory Distempers, is to be accounted for, and we are hereby warned against the Use of Volatile Salts, and Spirits, which are so much in Vogue with some Men at this time; because they suppose the sizyness of the Blood to be owing to a *Coagulating Acid*; the contrary of which appears from Dr. Pitcairne. *Dissertat. de Opera quam prestant corpora, &c.*

The Blood then is made viscid, upon several Accounts, and from this viscid Blood, will be separated a less quantity of *Saliva*, and that more *Slimey* than in a natural State; the greatest quantity of the *Saliva* being separated when the Blood moves more slowly, as appears by making a Ligature on the *Jugulars*; and hence we may account both for the *foulness* and *dryness* of the Tongue in *Feavers*; and the *Orrifices* of the Glands being straitned by the stimulating Heat, the Quantity of *Saliva* will be less, and the most *fluid* part of that, being evaporated by the Heat, and thereby the Mouth becoming *dry*; from thence proceeds that *intollerable Thirst* which the poor Patient often is tortured with.

An increased *velocity* of the Blood, will increase the Quantity of *Animal Spirits*; from whence the *nervous Tubes*, and all the *motory Fibres* will be fuller, and more *Tense*; and render sensation *stronger*; and it being a necessary requisite to Sleep, that the Fibres should be relaxed, and the Animal void of *Sensation*; and since neither of these can happen, when the animal Spirits are separated in greater Quantities, as they will be when the Blood moves more swiftly; therefore the great *velocity* of the Blood, will prevent Sleep.

And the Nerves being fuller of Liquor, its *In-dulations* will be more *Dense* and Quick, Sensation will

will be more lively, and there being less Impulses upon the Extremities of the Nerves, will cause the Patient to be *Delirious*.

Besides *this*, the Blood will have acquired a greater Solidity, by the Evaporation of its thin Parts; and its *celerity* being increased, the reflux of the *nervous Fluid*, to the Brain, will be as quick, as if the Motion of the Blood was slower, and the Nerves were struck upon, by *Effluvia* from External Objects, so that the same *Idea's* will be excited as if those Objects were *really* present, and the actions of Men being always adequate to the *Idea's* they have, there will be an imagination of such Actions as are produced by external Objects, when none such are present, such as those consequent upon Joy, Fear, Anger, and the like; and hence also, the Patient acts *irrationally*, or is *Delirious*.

The Muscles are contracted by an *Ebullition* of the arterial Blood and *Animal Spirits*; and Convulsions, are nothing less or more, but the *involuntary* contraction of the Muscles, by the shaking of the *Nervous Tubes*, thro' which they are conveyed.

A *Subsultus Tendinum*, or Twitching is caused by the Motion of the Blood, which being in a *Preternatural* Heat, renders it so *viscid*, that few or none of its Particles are small enough to enter into the narrow Orifices of the Nerves. The supply of Spirits, being hereby cut off, their Quantity will continually *decrease*, till it is so small as not to keep the *Antagonist Muscles* equally contracted, whereby the Entrance of more Spirits into that Muscle, is not only prevented, but the Spirits remaining in that Nerve which terminated in the contracted Muscle, are forced back into that place where there is the least Resistance, and that is the *Antagonist Muscle*.

Muscle. And since the quantity of Muscles are so small, the Contraction of them will be very weak, and the convulsive Motion will be a sort of *trembling or twitching*.

The influx of the Spirits into the Nerves, by the Pulsation of the Arteries, being *alternate*, so would their *Efflux* be, thro' the *Emissory* into the Muscles, were it not for the fulness of the Nerves, whereby the *Efflux* becomes continual. *Therefore* when the Nerves are much emptied the *Efflux* will be sensibly *alternate*; whereby the Muscle will be *alternately* contracted, or there will be *twitchings* of the *Tendons*, or what we call a *Subsultus* of the *Nerves*. • The Patient, in *this Case* hath a weak interrupted Pulse, *Cold Sweats*, &c.

The Pulse becomes weak, by defect of the Spirits to contract the Heart; and because the Blood still becomes more *viscid* by loosing its *Serum*, in *Sweat*, its Motion thro' the Arteries must be slower, whereby the Resistance to the Contraction of the Heart will be greater; *Wherefore*, a greater quantity of Spirits must be *derived* into the Heart, to overcome this *great* Resistance, and so a longer Time must be spent, before the Heart be contracted, or the interval between the two Pulsations of the Heart will be greater. But the Resistance being overcome, and the Contraction of the Heart being stronger, caused by a greater quantity of Spirits, derived into the Heart by a larger time, the *Contraction* will be quick, as usual, till the increased Resistance put a new stop to it, or the Pulse will *intermit*.

The deficiency of the Spirits must needs relax all the *Fibres*, so that the Pores of the Skin will be *exceeding wide*, and *therefore* the Patient will *sweat*; and because the Motion of the Blood, is so very

slow

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flow, the heat of *that*, and consequently of the *Sweat*, will be less, than in an healthy Person; *for which reason*, he will judge, that it is *cold*.

The Spirits, still wasting, and the Blood's viscosity increasing, at length, they will be unable, to contract, the Heart, by which, the circulation of the Blood, will cease, *and the Patient will die*.

From *hence* we learn, how wrong, their Practice is, who instead of stopping the too impetuous Motion of the Blood, with *cooling diluters*, and moderate evacuations, *increase it*, by their heating Cordials, and *Alexipharmicks*.

This is the substance of Dr. *Wainwright's* reasoning, who farther says, " That in Inflammatory
" Feavers, what more desirable than cooling Li-
" quors, and in general, nothing more Benefici-
" al. Or what more detestable than Cordials?
" bitter Alexipharmicks, and testaceous Powders?
" such as Corral Pearl, Gascoignes Powder, and
" nothing more prejudicial.

Thus Learned Men differ in their Opinions, and therefore to the consideration of the Learned, we leave it.

Of F E A V E R S.

Their Theory, &c.

W H A T we now call *Fermentation* of the Blood, the *Antients* called *Putrifaction*; naming such Feavers, as they conceived to arise from thence, *putrid Feavers*, meaning thereby, a
more

more mild dissolution, of the Blood; that *hinders*, but *not wholly* suffocates the *vital Expansion* of it, and they used to affix, the Epithet *putrid*, to whatever, by a swift Motion, degenerates into the Nature of *Pus*, or *Quittor*. So that the *Materia Febrilis*, and *Fermentum Febrile*, are but two different names of the Cause, whence the Feaver, or *Fermentation* of the Blood comes.

Crude Humours mixed with the Blood, are supposed to be, generally the *material Cause*, and the *Fermentum Febrile* the *Efficient cause* of putrid Feavers, and from a *malignant crudity* of matter, mixed with the Blood, arise *malignant Feavers*.

There are two different *Ferments*, incident to our Bodies, *viz.* *Fermentum irritans*, which directly, and *Spontaneously* irritates the vital Spirits, and excites them to Seditious Motions, with it's grosser part. 2. *Fermentum opprimens*, this directly oppresseth, the said *vital Spirits*, opposing their *Expansive Motion*, tho' afterwards and by action, it irritates them, to a *Pneumatick Fermentation*. Not such an one, as dissolves the whole mixture, but only to attenuate, discuss and exterminate *that Ferment*, which by clogging them, hinders their *Expansion*, and the *vital mication* of the Blood thereon depending: And this seems to be, that kind of Ferment, by which a Fermentation of the Blood, is raised or excited, in putrid Feavers, and for that Reason should be nominated, *Fermentum Febrile*.

The aptitude of this *Fermentum Febrile*, to fix the Spirits, of the Blood, doth consist in a certain *Lentor*, or clamminess of the Crudities, mixed with the Blood, like to Wine, or Beer when it is *Roapy*, which a new Fermentation corrects; exciting the oppress'd sluggish Spirits, contain'd in the

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the Liquor, and dissolving the clamminess of the grosser Parts, clarifies it.

There are *others* (not without reason) tell us, that a putrid Feaver is, when the Oilie, Sulphureous Parts of the Blood being too much heated, grow above measure, *turgid*, and are brought into a Flame; and from it's likeness to *humid* things, putrifying, which contract a *fervor*, it is called a *putrid Feaver*.

Since as has been shewed, that all Feavers, consist in a Fermentation of the Blood, we may suppose, that the diversity of Feavers proceed from the *different Fermentations*, of the same Blood, the diversity of Effects, being *generally*, according to the diversity of *Efficients*. And there are as many differences of *Febrile Ferments*, as there are diverse Natures, and dispositions, of Crudities incident to the Blood.

By *Crudity*, we understand any *inquinament* or depravation of the Blood, proceeding from the defect, of due preparation thereof, for the generation of vital Spirits.

Now the matter, in *this Sense crude*, may be distinguished, into *ordinary* or familiar to human Nature; or *extraordinary* and *hostile* to it, the first ariseth from the Erroneous use of the *non naturals*, and from *thence*, come all Feavers, *Simply putrid*; and from the *latter*, those that are malignant, and Contagious. The ordinary may be divided into *recent*, and *inveterate*; 1. *Recent*, or such as are either carried out of the Stomach and Guts. in the form of *crude chile* or *educed* from some part or other inflam'd, or otherwise corrupted, 2. *Inveterate* or in a long tract, of time by degrees *congested*, and adhering to the substance, of the *Sollids*. The *former* if it passes into the *Febrile Ferment*, produces a *putrid Feaver*, but of *one Paroxysm on-*

ly. The latter also, produces a *putrid* Feaver, either *Simptomatick*, or accompanying some other mallady but each of them, either continual and of certain *Exacerbation*, or intermittent and of uncertain *Paroxisms*.

The *Febrile Ferment*, will not kindle a Feaver, so soon as it is existent in the Body, but by passing thro' *certain degrees* of Operation *Successively*; first it is diffused thro', and intimately mixed with, the whole Mass of Blood, after the manner of other Ferments, then wrapping the vital Spirits gradually, by its clammyneß, it disposes them to sloth; then it indeavors to bind and suffocate them, and then the Fermentation begins: But if it be asked where it lurks till it acts; we answer, it is in the *Parenchyma* of the Parts, nourished out of impure Juices. And Hence, Men recovering from long Feavers, if they live temperately, attain to an excellent State of Health, *because*, all the Substance of the Parts that was amassed out of crude and impure matter, being by the Feaver consumed, their Bodies are now repaired with pure Juices, such as abound with Spirits, *duly* exalted, and concocted.

Therefore, in a violent Feaver, if the Habit of the Body be not exterminated in Proportion to the Violence or Duration of the Feaver; the Cause lies in the great viscidty or clammyneß of the *Crude Matter* affixed to the *Parenchima* of the Parts; and from hence, we may judge, that the Feaver will prove either of long or short continuance, if not *fatal* in the End.

Yet on the contrary, if the Extenuation be too great and sudden, it proceeds from the great Heat of the Feaver, or force of the Ferment, which dissipates, *not only* the crude matter, but the vital Spirits also. Therefore, such an impetuous Extenuati-

on is both *Sign* and *Cause* of a very fore Calamity to the Patient.

In the *Ephemora*, there is an inflammation on the Spirits; in the *humoral*, a *Fire* in the *Humours*; in the *Heetick*, one in the *solid* Parts; and in the *Malignant* a venomous *Miasm* infects the Blood, and Congeals its Liquor.

By Malignity (saith *Etmullar*) we can conceive nothing else, but an acrimony in such excess, that its vehemently operative, even in the least Quantity imaginable, which makes upon the *nervous System*, an highly destructive, preternatural Expression, and brings on the Humours, a *putredinous* mutation of their proper texture.

A *Causus* performs its Course with great Burning and intollerable Thirst, with great inflammation of the Blood, and differs from others in this; that the Temper of the Blood is hotter, it rages more extreamly, its motion is very Hostile; it soon comes to a height, and is attended with more horrible Symptoms; it has a more difficult *Crisis*, and its End is very dangerous.

The Cure of all Feavers, simply Putrid, consists in three things. 1. In dissipating the Crudities mixed with the Blood. 2. In moderating the begun Ferment. 3. In conserving and strengthening the vital Powers.

The first is done by Evacuation, abstinence, thin Diet, Acids, Sudorificks, and Phlebotomy. The Second is performed by Acids, refrigerating Julips (not spiritous) *Ptisans*, and cooling Drinks, such as shall be named at the end of this Head. But when the febrile Ferment is too slow, we are to have recourse to *Stimulators*, to help Nature in the Conflict, such as Sudorificks, and spiritous Cordials, because they help the Fermentation, and dissolve the *Clamminess* of the febrile Matter, and thereby

Thirdly, The Conservation of the vital Powers, is of great Moment; and *here* generous Cordials, Specificks, Antidotes, &c. have place.

Sudorificks, render the Crudities more *fluxile*, and by their *tenuity*, penetrate their inmost *Recesses*; cut and rarify Humours into Vapours, and expel them by the Pores; but, *great Caution* is to be used, lest administering them, before the matter is ripe, the Fermentation be augmented.

Phlebotomy, lets out part of the matter, floating in the Blood, and makes room for a freer Fermentation, and prevents the *eruption* of the Blood out of its Vessels, into some *noble Part*.

In the *increase* of the Disease, bleeding ought to be repeated if there is occasion, and a free transpiration may be procured, and Glisters exhibited, but *then* Catharticks and Emeticks too much *Exagitate* the Blood, but Julips, cooling Decoctions, and Acids of Vegetables that restrain the Ferment are of use.

When the Feaver is come to a *Crisis*, strong Catharticks are not to be medled with, but upon the abating of the Symptoms, if the Motion of Nature be slow, a *gentle* Cathartick or Sudorifick may be given with Safety.

But if all things be in a *Perturbation*, all things *Crude*; the *Urine* without Separation, *Pulse* low, *Strength* weak, &c. they must not be attempted, but exhibit temperate Cordials, let the Effervescence be stopped, and a due Fermentation be maintained, and this is well performed by *Pearl* and other *Testacea*, and Glisters, &c.

In the Declension of a Feaver, there is not much for a Physician to do, but to direct to an exact form of Diet, in order to recover Strength, &c.

Where the Body is extreamly wasted, and the Spirits almost spent, strength quite decayed and

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gone (*as it were*) after a violent Feaver, the following Wine, comes in, to very good Purpose, and like help from Heaven.

Take six Female Vipers, in the Spring, put them alive into six Pints of Canary, and let them stand close stopp'd without any heat for six Months; in which time almost all the Substance of the Vipers will be dissolved, then strain, or filter for use.

At the same time, you put the Vipers in the Wine, and set it by, put (in another Bottle) four Pints of Canary, into which, put fine pick'd Flowers of Lavender, and Rosemary, (both Green) of each, one Ounce and half, one Nutmeg sliced, Satyrion Root sliced two Ounces, Benjamin, and Storax, of each half an Ounce, Musk and Ambergrease, of each Seven or Eight Grains, and strain off, when you strain off the Viper Wine, and mix them together, and put to them a Quart of *Chalibeate* Wine, (made with juice of Oranges, and white Port,) and shake well together. Dose Two or Three Ounces twice a Day.

This is *a most noble* Restorative, not only for People whose Constitution has been almost tore to Pieces by the fury of a Feaver: But for all *acute* Distempers, and particularly for Women, who have suffered much in Child-birth, and are reduced almost to a Consumption; and it has the Faculty to raise the Blood to new Warmth and Nourishment, it is also of great use, to such as have been under divers Salivations, or worn out with venereal Embraces; or have been injured with *Mercury*; and it will repair any Constitution that is not *quite rotten*; it will restore the decay'd Juices, and *refil* the Veins, with a warm, generous, and nutritive Blood, &c.

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After a Feaver, when the Blood has been boiled up into a *Retorrid Crassis*, give this *Ptisane*. \mathcal{R} *Rad. graminis, rusci, dent. leon. aa. Mi. uvar. corinth. incis. ℥ii. coq. in aq. font. ℔iii. ad ℥xxviii. colat. & dissolv. sal. prunel. ℥ii. syr. c. 5q; radicibus ℥iv. misce. Dos. ℥vi. bis in die.*

Also, this *Aperient*, *Ale* \mathcal{R} *Rad. s. aper. cichor. filic. mar. glycirrh. aa. ℥ii. herb. ling. cerv. hepatic. heder. terr. summit. tamarisci aa. Mii. bac. juniperi. sem. fenic. dulc. aa. ℥ii. passul. sol. exacinat ℔℥ f. sacculus pro. Cong. iv. Dose ℔i. twice a Day.*

N. B. When the Venom of a malignant Feaver assaults the Spirits and stupifies; *then* generous Alexipharmicks are to be exhibited. *But* when it is of a quick and furious Nature, (as in all inflammatory Feavers, that partake of Malignity, and in the Measles, and Small Pox, &c.) *then* they are to be forborn, or very cautiously administred; *Because* they are apt to drive the Blood into Fervors, and the Spirits into Fury, &c. *Fuller.*

Observe also, that when you have given Alexipharmicks in their proper Place, and that you find the Vigour of the Blood and Spirits is *regained*; you must forbear their Use, or at least, lessen the Dose, and give them seldomer, lest you fire the Blood too much, and so destroy the Patient.

In high inflammatory Feavers, the more Juleps are made Acid (says Dr. *Quincy*) the better; if warm Alexipharmicks are joyned with them: *But* in slow malignant Feavers, where the Complexion is pale, the Forehead cool and clammy, and the Pulse low and *ticking*, they ought to be well charged with Volatiles; but then they ought to be dulcified with Brown Syrups, or Sugar, or they will turn Green and Unsightly.

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In ill Feavers, where the Spirits are oppressed, and great Drowsyness attends, a Cataplasim of Herrings, to the Feet takes place.

And where there is Startings, Twitchings, Tremblings, and the Spirits sink, a Cataplasim of Mustardseed, Grains of Paradise, Baysalt, Black Soap, &c. are applied with Success.

But in Feavours with Watchings, Deliriums, Phrensies, and Convulsions, Warm Pigeons, and Chickens split in two, also Lambs Lungs, &c. applied Warm, and changed as occasion serves, are more proper. Also Plaisters to the Feet, of *Emp. cephallic. cum euphorbio, camphor, & ol. succini, &c.*

Examples of some Alexipharmicks.

Rx Aq. lactis alexiterii. Ceras. nigror. aa. ℥iv. aq. rute ℥iij. aq. epidem. ℥ii. tinct. croci ℥i. syr. carioph. ℥ii. lap. de goa & contrayerv. aa. ℥i. confect. alkerm. ℥ii. misce fiat julapium. Dosis cochl. 5q; tertia quaque hora.

Rx Lap. de goa, & contrayerv. & pulv. gascoign. & pulv. serpentar. virgin. aa. gr. 5 fiat pulvis.

Rx pulv. Rad. serpentar. virg. contrayer. angellic. hispan. & theriac. venet. aa. ℥β Mirrha ℥ii. Croci Div. cochinel. ℥ii. S. V. tbi. fiat tinctura.

Rx Pulv. serpentar. virg. gr. xv. ther. ven. ℥β ol. N. M. gtt. ii. laud. liq. gtt. xvi. syr. e. meconio. q. s. fiat Bolus.

Of ALEXIPHARMICKS.

Their Operation Explain'd.

THE Vertue of an Alexipharmick, consists principally, in stirring up a fresh Ferment in the Body, and thereby rouses up the sinking Spirits, recovering a due Mixture to the Blood; bringing it off from Putrifaction, and Coagulation; whereby Nature is inabled to expel the deleterious Matter. Now to produce such a Ferment, there are required *Heterogenious* Particles, that cannot be intimately mixed with, or subjugated by the Blood; and the greater the number of the Ingredients are, so much the greater, will be the *Heterogenity*, and by consequence the *Fermentation* also; thus we see the great Alexipharmicks, (such as *Venice Treacle*, for Example) are an huge *Hodge-Podge* of things, greatly unlike one another; which because experience hath established, for standing Medicines, some body hath this Expression (saith Dr. Fuller) that a wise Man will make use of that which none but a Fool would have invented.

And as to *Scorzonera*, so common in use amongst Alexipharmicks, I am not satisfied (says the Dr.) that so insipid, and inodorous, a Vegetable can have much Alexipharmick vertue in it. I like much better such as *Serpentaria*, and *Contrayerva*, that have something so indelible, in them, that a small quantity, mixed in a very great one, of any other Ingredients, will not be lost, but taste thro' all; and tho' some may object against them, as too hot in the small Pox, &c. Yet such Objectors, speak Unexperimentally, having not been very conversant, in the management of such malignant Feavers, as are not inflammatory, but depressing.

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Alexipharmicks, as well as *Febrifuges*, and *Diaphoreticks*, may (in a sense) be included under the same name, because *more or less*, they all of them, bring a *Diaphoresis*: And this they do, either by dividing and attenuating the *Fluids*, so as that they are able to pass thro', the *cutaneous Glands*, or by their contracting the *Sollids*, force out, whatever lies ready for *Expulsion*, in the *Surface*: and of the former sort, are all Aromatick warm Bodies, who have a *natural* tendency to do so, and of the latter, are all *Acids*, which much contract the *Fibres*, and those *Diaphoreticks*, that have Power to throw off the Poison of malignant Feavers, may justly be termed *Alexipharmicks*.

Some Examples of Drinks in FEAVERS.

R \acute{e} aq. font. ℥xxvi. succ. Lymon. & Sacc. alb. aa ℥ii. cochinel. Di coq. ad despumationem, tandem adde. aq. ros. Dam. ℥iiii per Subsidentiam depuretur.

R \acute{e} passul. solis Enucleat. & minut-im incis. ℥4. coq. in aq. font. ℔iiii. ad ℔ii & colat.

R \acute{e} Salis prunel. ℥i sacc. alb. ℥4 cochinel. gr. xvi misce fiat pulvis. Put it all into boiling Water ℔ii, scum and let it settle, and decant the clear.

R \acute{e} tamarind. ℥ii. passul. solis ℥4 coq. in aq. font ℔iii ad ℔ii colat. Or instead of Tamarinds, you may put in Sorrel Roots.

R \acute{e} aq. font. pure, ad medias coctæ ℔ii syr. violarum ℥iii spir. vitrioli q. s. ad gratiam.

R \acute{e} Posset drink made of Dandelion, or Sorrel, or aq. hordei, made Acid, with spir. sulph. vel vitrioli, &c.

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Also emulsions made of the cold Seeds, and white Poppies, and Almonds, &c. with Barley Water.

When the Mouth and Tongue are dry, hot, and parched, R^x syr. dialtheæ alb. ovor. aa ʒi. sacc. alb. q. s. vel. ʒss. misce fiat lohoch. Or,

R^x aq. plantag. & E. flor. sambuc. aa ʒ4 aq. ros. rub. ʒii alb. ovor. No. 4. sacc. alb. ʒi. fiat gargarisma. or R^x rad. altheæ. liquorit. hord. mundat. aa ʒi. cort ulmi intern. gum. arabic. aa ʒss. ficorum incis. No viii coq. in aq. font. lbiii ad lbii vel ʒxxxviii. colat. & adde. syr. altheæ ʒiii. lohoch. sani ʒss. fiat gargarisma. R^x conserv. cynosbati ʒss. syr. E. succ. sambuci & ol. amigd. dulc. aa ʒss. fiat mixtura, &c.

And thus we find, that both hot and cold Medicines, Alexipharmicks, and cooling Ptisans, have their several uses in Feavers, if wisely administered; my design being, not to pin any Man's Faith upon my Opinion, but to let others see, what the most Ingenious Men that profess the Art, have said upon the subject, and leave all Men to make a judgment according to their Reason, both in this, and every other matter contained in this Treatise.

And since the writing of this, it has been upon my mind to say something, to those sort of Feavers which are commonly called *Inflammatory* and *Nervous*, or a Feaver of the Blood, and a Feaver of the Spirits: Which hint I owe to, the Performances of Dr. Quincy, and which I am not ashamed to give him the honour of.

Of Inflammatory and Nervous Feavours, or Feavours of the Blood and Spirits.

AN *Inflammatory Feaver*, or a Feaver of the Blood, he says has frequently its Cause from a *Diminution* of some of the natural Discharges, by which the Blood is increased in quantity, and if it does not go off by an increase of some Evacuation, but continues burning, until the Solids have all their Moisture exhausted, and they be thereby rendred uncapable to perform their Contractions, *the Patient dies*; and here, all spiritous Juleps are pernicious (and he says, Blistering too) but cooling Juleps, Ptisans, Emulsions, &c. are of the last importance, as is a *Diaphoresis*, if it can be procured to any purpose, which commonly either terminates the Feaver, or brings it to an Intermission.

The Nervous Feaver, or Feavour of the Spirits, has its rise from an *Excess* of some of the Discharges, or from trouble of Mind, Abstinence, or contagious Air, and commonly the Patient is feeble, sluggish, has a slow Pulse, no Thirst, rather cooler than ordinary, stupid, takes little notice of any thing; stammers in his Speech, and fumbles with his Hands, with twitchings of the Nerves, and sometimes troublesome Hiccoughs; and at other times there appears Spots under the Skin, of uncertain Colours; and sometimes their is looseness, with black fetid Stools, and Urine of the same Colour; the Eyesight is much impaired and some

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sometimes, *for the present*, the Patient is very *Deaf*. Which last Symptom is *generally* a sign of Recovery, especially if the Peccant Matter discharges it self by a running at the Ear, which is a critical Discharge of the morbit Humour upon those Organs, and sometimes after such a Disease, where it has been *severe*, the Patient does not for a long time (and sometimes never) attain to that Vivacity, and quickness of Understanding, which formerly he enjoyed.

An inflammatory Feaver, sometimes degenerates into *this*; and then its Cause is in the Distemperature of the *Nervous fluid*, which becomes unfit to give a due *Elasticity* to the Sollids, or *such* as is necessary to carry on their Contractions; and after much vehement hot Weather, the spring of the Air is impaired, so that *part of it*, which mixes with our Blood, is not sufficient to raise its Globules, so that they run into preternatural Cohesions; besides, in such Weather, there is such a waste of the Nervous Juices as over weakens the Sollids, and spoils their Contractions, and brings on a universal Relaxation.

And as any Evacuation, which cuts off a Supply of this nervous Juice, must be attended with the same Consequences; Phlebotomy, *in this Case*, seems to be forbid, as well as Catharticks; both which rob the Sollids of due Supplies, and abate the force of their Springs; and so suffers the Blood to run into intestine Motions and Cohesions; and *from hence* we may infer, that continual purging and often bleeding, in *Cutaneous Distempers*, is no *Rational* Practice; and such as drink the Waters for a long time together, or any of the purging Ales, and think it a very healthy Custom, are very much in the wrong; for they hereby keep their Body in such a very lax state, as spoils the Functions

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ons of the Cutaneous Pores, and renders the Solids
so feeble, that they will not be able to withstand
the Insults of any Distemper of a rigorous
Nature.

And now the contracting Vessels being thus
weakned by Evacuation, they are not able to give
such due Motion to the Fluids, as will prevent
their running into preternatural Cohesions, so that
they *Coalesce* into Particles of different Magnitudes,
from what are useful to the Body, and from
what the secretory Organs are appointed to
strain off; and hence after some time, the Patient
has black *fetid* Stools, and sometimes abscesses
arise, and discharge a *fetid* Matter of the same
Colour; both which are nothing else, but a
Dispumation of the Juices during their Fermen-
tation, and thrown off by the intestinal Glands,
or by an Absces; consisting of Particles, which by
reason of their peculiar Figures and Gravities,
were unfit any longer to associate *with*, or make a
part *of*, the remaining Juices; as may be seen in
all fermented Liquors whatsoever; now when the
Sollids loose their contracting Force, before this
Dispumation can be perfected, the Patient dies.

But sometimes the Dispumation shews it self in
Spots on the Skin, as we before observed, of vari-
ous Colours, according to the present state of the
Fluids, as florid, dusky, livid, and quite black;
and from the colour of these Spots we may draw
very shrewd Prognosticks of the future Condition
of the Patient; for the matter of these Spots, be-
ing raised from the grumous part of the Blood,
which ferments for want of fit agitation, the
more these Spots degenerate, from the natural
colour of the Blood, the greater is the *Discrasie*
of the Blood, and by consequence the greater is
the Danger of the Patient.

The

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The Patient's Stupidity proceeds from such a diminution of the Spirits, or relaxation of the Fibres, that the *Crafsis* of the Blood is so spoiled thereby, as not to afford sufficient Recruits, and the Nerves are incapable to give a necessary supply of animal Spirits, to help on the proper Vibrations. Therefore, the only way to cure the Patient, is to maintain the proper Vibrations of the Solids, and hasten the depuration of the Juices, and the discharge of the *Spume*, which tho' sometimes, but very little in Quantity, yet if it be expelled, the Patient commonly recovers. Yet it is fruitless to attempt it till we see which way Nature is disposed to do it, whether by Stool, Urine, Sweat, &c.

Now to keep up the Vibrations of the Solids, till Nature can by one of *these ways* exonerate herself, *Stimuli* are to be applied externally, and generous Cordials, and *Volatile Alkali's*, are to be given inwardly, to furnish *them* with fresh supplies of Spirits. Amongst the *Stimuli*, are Cantharides, whose Property is, not only to raise Vesications on the Skin, and so carry off the peccant Matter that *way*; but their subtle parts mix with the Blood, and so move the Fluids more briskly, whilst the *Volatile Alkali's* striking upon those parts of the Blood, which have run into preternatural Cohesions, give them no rest, till they find a way, to get out of the Mass of Blood, by the most convenient *Emunctories*.

Of

Of the CHOLICK.

THE Word *Cholick*, strictly taken, signifies disorders of the *Colon* only; but *more generally* it is taken for any painful disorder of the Stomach or Bowels, attended from first to last, with a thick muddy Urine. And from hence arises the Denomination of, 1. A *Bilious Cholick*, which springs from a Redundancy, or acrimony of *Choler*, irritating the Bowels, and so causing Gripings and generally a *Diarrhea*, which is commonly remedied by gently purging off, and softening the offending Humours by Lenitives, and Emollients. 2. A *flatulent Cholick*, and this shews itself by Pain, in the Bowels, and Wind pent up *there*; and this is helped by Carminatives and Aperients. 3. An *Histerick Cholick* which has its rise from Disorders of the Womb; and affects the Bowels by consent of Parts, and is to be managed with *Histericks*. And, 4. A *Nervous Cholick*, from Convulsive Spasms of the Intestines themselves, by reason of some Disorder of the Spirits, or Nervous Fluid, which often occasion obstinate Obstructions; and this is best managed by brisk Catharticks, in Conjunction with Opiates; and Emollient Dilutors, taken plentifully at the same time. And, 5. A fifth sort has its denomination from the Stone, and is called the *Stone Cholick*, arising from Irritations of the Stone or Gravel in the Kidnies, or Bladder, and so causing extream Pain (like the *Histerick* kind) by consent of Parts, and this is to be incounter'd with Nephreticks, Oiley Diureticks, and Carminative, Turpentine, Glisters, &c.

Now

Now all these arising from the different Causes, and producing different Effects, must be treated in Methods as much differing one from another; and tho' they all have the same common Symptom *Pain*, which in some Cases, is taken off by *Opiates*: Yet should we endeavour, *first*, to take off this *Symptom* in some of these Cholicks, without having a regard, *first*, to remove the Cause, we should fix it deeper; and run the hazard of destroying the Disease and Patient both at once; and should do the same thing in Effect, (as an ingenious merry Author has it) as if we should lay the Muzzle of a Pistol into the Patients Fundament, and let fly, in hopes to clear the way of all Obstructions.

Again; the inflammatory, or *Bilious Cholick*, we must not (with the Croud) have recourse to Spirits, burnt Brandy, nor Cholick Waters; and he that treats the Histerick Cholick, as he does any of the other sort; or manages them like that, acts not like a *Physician*, but as an *Empyrick*; nor is he more Wise or Honest, who uses hot Spirits, and strong Purges in the *Stone Cholick*, where soft, glib, slippery, and oiley Medicines; lenient Glisters, and cooling Purgatives, with *Opiates*, ought to take place.

And tho' in the *Bilious* and Hot Cholicks, cold Water, Milk and Water, Barly Water, Almond Milk, &c. are successfully prescribed; yet he that orders them in the cold Phlegmatick Cholicks, where hot Carminatives, warm Glisters, and Purges bridled with *Opiates*, are indicated, is in a most dangerous Error.

For divers Intentions are to be answered, according to the different Cholicks, and the appearance of different Symptoms. In one the Cure must be by hot things, in another with cold; sometimes strong Purges are necessary, and at other times weak ones, and

and sometimes no purging at all. *Sometimes* they must be joyned with Opiates, and *sometimes* Not; sometimes Sleep must be induced, and sometimes we must do no such thing; sometimes *Emeticks*, sometimes *Catharticks*, sometimes *Glisters*, and sometimes *none of them* are to be prescribed.

Dr. Fuller says, that in a Bilious Cholick, a Glister, *Ex vin. canar. & ol. lini aa. ℥vi. ol. succini 3℔ laud. liq. gutt. xl.* gives great Relief in tormenting Pains of the Bowels, and pertinacious Costiveness, by recreating the substance of the Guts, expelling Wind, and softening the Excrements. But if the Disease has its Seat in, or just below the Ventricle, then the most powerful Glisters signify nothing, because their Operation does not reach to the small Guts.

And of the same Opinion is Crato, (*Concil. 10. p. 85.*) *Clysteria si Malum, supra Umbilicum est parum juvant dum obstructiones, in superioribus partibus sunt parum Materiam attingunt; & sæpe usurpata in commodum afferunt.* And hence Sennertus (*de Cholica 881.*) affirms, that if Glisters do no good, and that the Matter is lodged in the Superior Intestines, they are not to be insisted on too long, and that when a certain Patient had received thirty Glisters, without any Relief; he was cured immediately, by another Physician, with an Ounce and half of Manna, and two Ounces of Oil of sweet Almonds, in Chicken Broth.

And in the histerick Cholick, Glisters are generally to be avoided, because they provoke the tender Fibres, and excite stronger Convulsions, and render the Disease more vexatious, and difficult of Cure, and sometimes they bring Death it self.

Pliny assures us, (*lib. 26. cap. 1.*) that the Romans knew nothing of the Cholick before Tiberius had it. So we never read of the Histerick Cholick (as such) before

before Sydenham, for altho' Piso (*An.* 1618.) published his Opinion of the Cholicks, being Nervous, and Willis made a farther Advance upon it; yet neither of them had a clear *Idea* of this *Spiritous Cholick*, so as properly to distinguish it from the Humeral one, and therefore, could not establish a right Method for its particular Cure. But it was Sydenham, alone, that distinguished it so essentially different from the Bilious Cholick, as that the Method that cures the one, intrudes the other.

The whole of histerical Affections are to be accounted for, from the irregular Disposition of the animal Spirits, and not from corrupt *Semen*, or *menstruous Blood*, sending up malignant Effluvia to the part affected, nor from a Depravation or Congestion of Humours.

And if the *Fomes* lay in the *Matter*, then vomiting, purging, bleeding, fasting, &c. would prevent Histerick Affects; whereas on the contrary, they constantly excite them. *Vide Sydenham's Epistle to Dr. Cole*, p. 141.

And, *ibid. de morb. acut.* p. 228. bleeding and repeated purging, which are most apparently indicated in the beginning of the Bilious Cholick, have no place here; except where there is a great fullness of Blood and Humours, which sometimes (tho' seldom) is found, except in Women of very sanguine Temperaments and *Viragoes*: For experience shews that *Pain* and all other Symptoms, will be exasperated by the Tumult, which Evacuations raise; and he observes, that the Repetition, tho' of the most mild Glisters, has brought on a continued *Series* of Symptoms.

And, if we consider that the Circumstances to which this Disease is owing, are great loss of Blood, Passions of the Mind, Hard Labour, &c. Reason will inform us, that it is rather produced
by

by the *Ataxy* and inordinate Motion of the Spirits, than by any Fault of the Humours, and tho' attended with *grievous Pains*; yet, *of it self*, there is no danger of Life, but it often becomes *mortal*, by those sort of Managements.

A Cholick is sometimes the Forerunner of the Gout or Palsy, and that, either from a translation of the matter to the Brain, and Nerves, or from Glisters unseasonably given, that discuss, &c.

When the Pain rages excessively, and that no Purges, nor Glisters, have any effect, *then* proper Fomentations *sometimes* bring unexpected Relief; and the way how they do it, is by reviving *native Heat*, driving off *Flatus's*, loosing the *Spasmodick Knot*, and by reestablishing the *Peristaltick Motion*, thro' the Intestines; and *then* Catharticks will have their desired Effect.

Sometimes, in a *Bilious Cholick*, when a cruel Pain takes Possession of some *one place* in the Ventricle and upper Intestines, and that many Glisters have been given to no purpose, or if on their Exhibition the Guts become Spasmodick, then a Cathartick with *Calomel*, and *Laudanum* in its Composition, will often give seasonable aid; because they mitigate the Pain, dissipate the Spasm, and vigorously stimulate and turn the peristaltick Motion downwards, *all at once*; but till they make their way thro', neither Spasm, nor Pain will cease, and if they have not this Effect (as sometimes they may *not*) then *Carminative* Fomentations must be applied, and the Cathartick repeated: and then you will hardly ever fail of the desired Success.

If Vomitting attends, the reason is, because the circular Fibres of the *Pilorous* Close it, and the Stomach becomes straitned, so that the Food is not able to pass over, and *then* Vomiting must needs be excited.

If

If *Choler* is ejected, the *duodenum*, and Gall-bladder are both affected, and if it terminates quickly, upon proper Remedies, its Seat was *only* in the *Colon*; but if it is rebellious, and continues long, we have Reason to suspect its Cause to lie in the *Omentum* and *Mesentery*.

If it comes from a manifest common Cause, or is from a slight accident, it is commonly without danger; but to Women with Child, or in Child-bed, to Consumptive or Old People, or if attended with a *Singultus*, Cold Sweats, Swearing, Delirium, coldness of the extreme Parts, Fainting, sickness at Heart, &c. it is to be feared, that Death is at the Door.

Of the Bite of a Mad Dog.

It's Symptoms and Cure Explicated.

IN the beginning, the Symptoms are peevishness, great anxiety, oppression at Stomach, and a gnawing there, Impotence to action, lassitude of the Body, restlessness, fearfulness, and this commonly, in Twenty, Thirty, or Forty days, sometimes sooner, sometimes later: And in some, it does not appear till three or four Months, and in others till twelve Months is past. And History informs us, of those, that after *three* Years, and of others after *seven*, have run mad, with this kind of bite; and not by the bite *only*, but *Galen* tells us the very *Saliva*, or flaver of the mad Dog will do it. *Lib. 6 de loc. affect.* and *Matthiolus*

tells us the same of his own Knowledge: And *Areteus* says it may be done by the very breath of the Creature.

If the Patient, does not run mad presently, but has the Symptoms daily growing upon him, as Pensiveness, Sadness, &c. it rises gradually step by step, from the foregoing Symptoms, to violent inward heat and thirst, and in a few days to an *Hydrophobia*, or a fear of, and horror at Water, or any Liquid, that is offer'd to him.

Now this *Hydrophobia* or fear of Water, does not come on, till three or four Days before death (and is a certain forerunner of it) and that is, when the preternatural Ferment of the Blood is come to it's height.

As to the Ferment, that causes this sort of madness, we are to know that whatever is thrown out from Liquors, in a Ferment, is capable of inducing the same Ferment, in another Liquor, of the same kind, when duly mixed with it; So the Fermenting Foam, or Spittle of a mad Dog, (being turgid, with fiery, Saline Particles) when thrown into the Wound, made by the bite, incorporates with the Arterial Blood of him bitten, and does raise in it, a preternatural *Effervescence* which shews it's pernicious effects, sooner or later, according to the nature of the Ferment, or Fermenting Fluid.

This fear of Water, (so peculiar to this disease) proceeds from, the intollerable pain, which any Liquor taken in at the Mouth (at this time) induces; partly by hurting the inflamed Membranes of the *Fauces*, in deglutition, partly by Fermenting with these active particles, discharged by the Blood, upon the Glands of the Stomach, and so twitching the Nervous Membranes, causes most intollerable pain in swallowing.

Before

Before this *Hydrophobia* is induced, there are forerunning Symptoms, of its approach, which when *they* appear, *that* is at hand, *viz.* a painful sensation, extending it self from the wounded part, to the Head (altho' the bite has been long cured,) the Limbs are distended, there is yawning and pain, by intervals, The Face looks red, the Mouth Foams, the Eyes Stare, look wild, and frightful, they spit upon, and strive to bite, any that come near them, and some bark like Dogs, and all this *involuntarily*, whilst some others, rave, are delirious, and insensible of what they do: But *all* of them, at the height of the madness, cannot bear to take any Liquid, into their Mouth, nor so much as to see it, without great horror, and anxiety.

To give a rational account, why persons under this unhappy Circumstance, are so fearful of Water, and so unable to swallow the least drop of it, requires a great deal of Philosophy, to discuss; but we shall only lay down *probabilities*, and leave our Reasons, to the judgment of the Learned.

If such People could not swallow any thing at all, any more than they can Liquids, we might suppose, the parts design'd for *deglutition* were Tumified, or under Convulsions, but this being not to be granted, because they can swallow Medicines, in other forms, we must not take up *here*, but proceed, and say, that the Blood, is composed of divers Liquors, which circulate through the common Channels of the Body: In which composition of the Blood, the *Saliva*, or Spittle is *one*; and this disease proceeding from the poysonous Foam, or Spittle of the mad Dog; it may by it's Similitude to our Spittle, infect *that* juice, above all the rest of the juices in our Blood, altho' we must suppose the *whole*, to be in *some* sort, in-

fected also: And as the *Saliva* is *mostly* invenomed, the Stomach naturally abhors it; and all Liquids, by their *Liquidity*, coming nearer to its Consistence, than Solids, the Stomach loathes *them*, for the sake of, and their near Similitude, to *that* and which the Patient cannot swallow, without swallowing some of *that* also, which he vehemently loathes, and detests.

As to the cure or rather prevention, of this disease, altho' I very little concern my self with prescriptions of any sort, in all this Treatise, for reasons obvious enough, in the Preface; yet this being, so dangerous a disease, and so little understood by common Practitioners, I shall take liberty to hint some things, in order to *prevent* this dreadful distemper; for when it is arrived at its height, and there is an *Hydrophobia*, I know of nothing, that will retrieve the miserable Patient, till death puts an end to his days.

First then let him be often immersed, in the Sea, if it can be, or at least in a Large quantity of Water, in which he must be well plunged, and remain for two or three Minutes at a time. 2. Cupping Glasses with Scarifications, actual Cantheries, Incisions, and Vesicatories, are often used, just as the case requires, and Symptoms indicate. 3. Garlick and Onions, with common Salt and Turpentine, are beaten up to a Cataplasme, and apply'd to the part, also the Wound is washed with a Decoction of common Docks, and the same Decoction taken inwardly: Also dip double Cloths in a mixture of Mustard and Vinegar, and apply to the Wound, and renew it as often as there is occasion. Also *R. fol. Ruta. verban. Salv. min. plantag. polipod. absinth. menth. artemiss. mellissophyl. Beton. hiperic. Centaur. min. aa p. & misce fiat pulvis.* This is to be given a $\text{ʒ}\beta$ ad $\text{ʒ}\text{iii}$. with a double

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a double quantity of Sugar, in any form you can best, and fast three Hours before dinner.

Also Pimpernel, Saxifrage, or Burnet, are by *Jome*, highly commended, as is *Theriac. ven. cum fol. Marrubii fætid.* by others. And our famous *Mead* recommends the Sponge of the wild Rose, others recommend *Galens* Preparation, from live Crabs, burnt upon Copper Plates, till they are fit to powder.

Others this Composition, *Rx mithridat. pulv. Rad. aristol. rot. aa ʒi terr. sigil. ʒβ muscarum que denapelli fructibus Victum querunt No. xx cum succ. Citri. q. s. misce. dosis ʒi ad ʒiβ.*

It is a common practice to give the Patient, a peice of the Liver of the mad Dog: But whether there is any Vertue in it, I declare I cannot tell: Only I believe this, that it will do him no hurt, if he has resolution enough to swallow it, any way Cook'd up.

The *Decoctum ad morsum Canis Rabidi*, from Dr. *Bates* is this, *Rx Rue ʒvi Filings of Tin, London Treacle, and Garlick, of each ʒ4 clear Ale ʒiiv. boyle to the Consumption of one half, and digest a while, and strain it, dose six Spoonfuls, for nine Days together, twice a Day, and. apply the Magma to the Wound. Vide, Pharmacop. Batean.*

When there are signs of an approaching madness, the keeping open several Blisters, is of great Service, being apply'd to the Thighs, Arms, and Legs, and kept running for a long time, and if you lay one to the Bite, and upon removing the *Cuticula*, you find the *Cutis* as it were burnt, as it sometimes will appear. Sprinkle upon that burnt part, *pulv. precipit. rub.* till the Slough casts off, and then keep the Ulcer open, at least Forty Days, before you heal it: Taking all that time

some proper Internal Medicine, such as some of the above named.

Of the Bite of a Mad Dog.

A very Strange History of one.

WE shall now present the Reader with a remarkable History, of this kind of bite: The first is from Dr. Lister, and is as follows, viz.

“ James Corton of York, a very strong and well
 “ built young Man, was bit with a mad Dog, in
 “ the right Hand: The Wound healed of it self,
 “ and the thing was forgot; after about five or
 “ six Weeks, he complains of a pain, all over his
 “ Bones, but especially his Back, and round about
 “ his Stomach, looks very pale, hollow Ey’d, &c.
 “ the third day after this Complaint, which was
 “ Sunday, March the 11th, 1682-3, he called for
 “ burnt Brandy, drank it, went to Bed, and vomited it up, after this he had a restless Night,
 “ and in the Morning found himself very ill, with
 “ a strong rising in his Stomach, and though no
 “ Thirst, yet an Impotence to drink, and even
 “ to swallow his Spittle, which was Death to him,
 “ as he often said. *Diascordium* and a Bottle of
 “ Cordial Water, was brought to him, by an
 “ Apothecary, that Morning: The *Diascordium*
 “ he took, but was not able to drink one Spoonful
 “ of the Cordial, this was on Monday morning:
 “ About one a clock that day, I first saw him, and
 “ found him upon his Bed, his Pulse very slow,
 “ and

and sometimes unequal, but not unless frightened, from the rising of his Stomach, his Flesh cold, his Tongue not dry, but flexible, moist and a little white. I caused him to rise off the Bed, and set him full in the Light, and then because he mightily complained, of I know not what Sickness about the Stomach, I offer'd him of the Cordial, but he started and trembled at the approach of it: This I exceedingly admired, wherefore I called for a Glass of Wine or Water, and a Tumbler of Water was brought me up, which I gave him to drink, but he vehemently started at it, and his Stomach swell'd, and rose after I know not what odd, and strange manner, and I could then find his Pulse very trembling, and disturbed; I still urged him to drink, but as I put it forwards, to his Mouth, he the more affrighted, drew back his Head and sigh'd, and Eyed it, with a most ghastly look, not without shrieking, and noise; this soon convinced me, that it was *aqua pavor*. I forthwith order'd a Vein to be opened, in the Arm that was bit, caused the Wound to be Scarified, and drawn with Vesicatories, and the same Plaister to be applyed to the Neck and Legs, and the inside of the Arms. I order'd the usual and famed Antidotes to be given, as of *Theriaca, Ruta, agaricus, &c.* In Boluses, for 'tis to be noted, that Sollid things, in a Spoon, he could take, but yet not without much trembling, fear, and caution; and an earnest request, that no body would suddenly offer them to him, but give them into his Hand gently; and then he would by degrees steal his Hand softly towards his Mouth, and of a sudden, chop the Spoon in, and swallow what was in it. *Velut Canis ad offam.* and this

" he did more greedily, and readily than any
 " other Man could do. Of these Antidotes in
 " Boluses, he took 3i every Hour, and always in
 " this manner, for at least a dozen times taking.
 " Drink was proffer'd him, in the Night, but
 " he could not see it without horror, and the same
 " Motions from his Stomach: Nay he did affirm,
 " that as often, as by chance, he swallow'd any
 " Spittle, it went to his Heart, even as tho' he
 " should die that very moment. This Night pass-
 " ed wholly, without any Sleep, or rest. Tues-
 " day Morning I view'd his Blood, which was
 " both as to the Serum, and Cake, well colour'd,
 " and in such proportion as usual, in healthy Per-
 " sons, and of good Consistence, he had now a
 " violent Feaver upon him, and a very quick
 " Pulse: Water was offer'd him, by my order,
 " but in vain, he begging he might die unmo-
 " lested, nothing being such a Terror to him, as
 " the approach of Drink, I then with much diffi-
 " culty perswaded him, to cast himself a cross the
 " Bed, upon his Belly, (for he had his Clothes
 " loosely about him) hanging his Head over the
 " other side, perswading my self that this posture,
 " might be advantageous to his drinking, since
 " that, in the erect posture of a Man, he could
 " not so much as indure, the approach of Liquor;
 " in this posture then, of a Dog, he suffer'd a large
 " Bowl fill'd with small Beer to be brought under
 " his Head, and imbracing it with raptures of
 " Joy, He declar'd, he was infinitely refresh'd,
 " with the smell of it: That he now saw it with
 " delight, and assured us, he should be able soon
 " to drink it all off; and he that but now, thought
 " himself a dying Man, talk'd pleasantly, and
 " said many passionate things to his Brother,
 " Wife, &c. Wonderfully extolling this inven-
 " tion,

tion, and thanking me for it, he endeavour'd
with great earnestness, to put down his Head
to it, but could not, his Stomach rose, as often
as he open'd his Lips: At length he put out
his Tongue, and made towards it, as though he
would lap, but ever as his Tongue touched the
Surface of the Beer, never so little, he started
back affrighted: And yet all this while was
pleased, with the thoughts of drinking, and
would not suffer, the maid Servant to take it
away from under his Head, and if she did a lit-
tle withdraw it, he said he followed it, by the
smell, with delight, snuffing with his Nostrils,
After a long time being mightily toiled, he al-
ledged, that the faint smell of the small Beer,
hindered him from drinking, and therefore de-
sired a Bowl of Ale, which was brought him,
but after much striving, and exerting his
Tongue a thousand times, he could not drink
of it, and lapping with great affrights, as oft
as his Tongue touched it, he started back with
his Head, bringing it gently down to the Bowl
again, a hundred times, but all in vain: And
in this posture, what upon his Belly, what up-
on upon his Hands, and Knees, he kept him-
self at least an Hour, thus tantalizing himself,
but it was not in his power to drink, we then
gave him a Quill, which consisted of two or
three Joins, the one end in his Mouth, the
other in the Liquor, but he could not manage
it, nor suck any more than a Dog. I perswa-
ded him to give over, and lie down, which he
did, and not long after my going away, he fell
into a Convulsion Fit, bit and snarled, and
caught at every body, and Foamed at the
Mouth; after this Fit was over, he had an *El-*
eborism in a Bolus, which was taken like the
rest,

" rest, and very willingly by him; it wrought
 " about three or four times very plentifully, and
 " he declared himself wonderfully at ease by it,
 " but yet now and then, was Convulsed, and
 " then always sensible: And after four Hours,
 " I return'd to him again, and found the Mi-
 " nister with him, he talked very sensibly to him,
 " pray'd very earnestly with him, saying the pray-
 " ers after him, and desired the Sacrament,
 " which in these Circumstances could not be
 " given.

" He was again Solicited to drink, and he now
 " readily enough, put himself into the former
 " posture, and with as much earnestness as ever,
 " used all the little shifts to drink, while the
 " Bowl was under his Head, but all in vain: He
 " had a little Silver Tumbler, fill'd with drink,
 " put into his Hand, when suddenly he had as it
 " were, stolen it near his Mouth, as if he would
 " have thrown it into his Throat, as he did the
 " Boluses, but it hit against his Teeth, and fell
 " into the Bowl. I cannot say he ever went to
 " stool, or made water, all this time, and there-
 " fore had a Glister given him, but upon parting
 " with it, which he did immediately, almost as
 " soon as given, he died Convulsed: But his not
 " making water, as well as troublesome Priapisme
 " which he complain'd of, when upon his Knees,
 " might proceed from the Blister Plaisters, as
 " well as the Disease. And (*which he afterwards*
 " *adds*) which was very remarkable, the Dog
 " that bit him, was alive and well, at this Man's
 " death.

Some Histories mention, persons falling into
 an *aque pavor*, through frights, and bites of
 Epileptick Persons; but whether that be possible,
 we shall not here determine.

Of the Bite of the Viper.

THIS is an accident that seldom happens, and by consequence but little understood, for which reason (and for that but few have treated of it) we shall say a few things to it here. The Viper has properly but one ventricle in the Heart, and the circulation of the Blood, is performed, like that of a Frog, or Tortoise, in which not above two thirds passes through the Lungs. Their Blood is very viscous, and their nourishment lies long in the Stomach e'er it dissolves, and therefore they can live long without fresh supplies of Nutriment.

Its venomous Juice or Poyson that does the Execution, is no more than one drop, of a yellow Collour, separated by certain Glands, seated about the sides of the Head, and thence by a proper duct, lodged in peculiar Membranous Bags, situate on the sides of the Jaws, and which at the time of its bite, is thrown from thence with a certain force, through the Cavity of the Fangs, which are naturally hollow for that very purpose. In which poysonous Juice, may be discover'd by a Microscope, a small portion of Salts *floating*, which in a little time shoot out into Christials, of incredible tenuity and sharpness; which Salts when thrown with force, into the Wound, irritate the Membranes, and cause a greater flux of the Animal Juices *that way*, which will cause acute pain, great swelling, at first red, afterwards livid, and spreads to the adjacent parts, causing Faintness, Sickness, low Pulse, bilious Ejections, cold Sweats, and sometimes pain about the Navel, yellow.

yellowness of the Skin, and (if not timely remedied) death it self.

Some will tell us, that the venom, does not lie in this yellow Juice, but in the Fury of this Creatures Spirits, irritated to revenge, and that this Juice *only* conveys it: But Dr. *Areskire* has made divers Experiments with this Juice, which he collected and apply'd to the wounded parts, which proved as pernicious as if cast in by the enraged Animal her self. And *Rhedi* tells us, that after the Salival Juice is exhausted by a few bites, all the rage the Viper can be put into, cannot make it's bite any way hurtful: But since this Juice is so venomous, and that the *vinum viperarum*, is made with the living Vipers, how is it, that this poyson is not imparted to the Wine, as well as the other parts of the Viper, or is the Flesh the Antidote to the poyson? or else why does not this Juice kill, mixed with the Wine, and so taken into the Body and circulating with the Blood, as well as if put into a Wound? for in *that* case, the *Spicule* mixing with the Blood, so dissociates it's parts, by pricking it's Globules, that quite alters it's texture, and from the various Cohesion of it's Globules, will raise different degrees of Fluidity, and impulse towards the parts, from what this *Fluid* had before, that it's very nature, will be changed, or Fermented, and the Elastick matter of the Globules, being in part let out, are a nimble Vehicle, to the acute Salts, to disperse them, thro' the Arteries; and not only *contaminate* the whole *Arterial Fluid*, but considerably change that of the *Nerves* also.

That the Male Viper makes two punctures when he bites, and the Female four, altho' a piece of some Peoples *Creed*, is however *not true*: For the Number of Teeth in either Sex, is uncertain, according

according to their Age. For sometimes there is six or seven in each side of the Jaw, besides one, two or three on each side, (of the oldest and most poysonous Fangs) fix'd perpendicularly, to the first Bone, of the upper Jaw, that so the young Vipers may be able to murther their prey as soon as they want it.

Poysons are vastly different one from another; this of the Viper greatly differing from the Bite of a Mad Dog, but specifically to distinguish them, or to demonstrate what sort of Particles their component Parts are formed of, is a Work for a *Medicade* only to discuss; it is sufficient for us to know, that without timely Remedies they *infallibly kill*: and that those Remedies, artfully applied and administred, have saved many a poor Patiens Life; and which is every honest Practitioner's Business.

History furnisheth us with Instances, wherein, upon a viperine Bite on the Finger, ligature has been made very hard, till some Assistance could be had, and the Finger then cut off, by which all future Mischiefe has been prevented; amongst local Medicines, after Scarification, *Theriac. Androm. Allium porr. Cepæ. Sterc. caprin. &c.* apply'd plaisterwise but above all, the *Auxungia Viperarum*, by which it is thought that the *Viper Catchers* cure themselves, and Dogs when bitten; most kinds of poysonous Animals, being themselves their own counter poyson, drawing forth the malignity by a sort of Sympathy, if outwardly applyed) and Internally nothing is found so Efficacious, as the *Sal Viperarum* given to $\mathfrak{z}\mathfrak{ss}$, if genuine: Authors indeed commend *Rad. Tormentil. Aristol. Retund. &c.* $\mathfrak{z}\mathfrak{i}$ for a dose, or *Succ. Ruta. vel. alii.* in a Glass of generous Wine, often repeated; or *Theriac Venet.* given the same way, and *Panada* boiled up, *cum Allio.* but to give a greater light into this matter, we shall

shall recite a case with some abridgements from Monfr. Charas, a Man very inquisitive in this matter: Which you may see in his *Exper. upon the Viper*, ch. 1. p. 74. 75, 76. &c.

“ A Gentleman (says he) twenty five Years ago, had been by chance the Day before, at my House, when five or six Dozen of Vipers, were brought thither; he would needs see them immediately, and I being desirous to satisfy his Curiosity, drew out of the Vessel one of these Vipers; he was not content to see her, but took her into his Hands, and kept her there about a large quarter of an hour, suffering her to turn and wind her self about his Hand, and Arm; the Viper, not so much as offering to bite him, then he tied her about the Neck, and so having hanged her, pull’d off her Skin, and emptied her of her Guts, to examine them, &c.

“ This Stranger the next Day, being come to my House, at the Hours of the Assembly, he saw one of the Vipers upon the Table, which had been held along time between Pinchers, and vexed; which he would take in his naked Hand, tho’ earnestly warned to the contrary; he had no sooner taken her in his Hand, but she turn’d her Head and bit him, with one of her great bent Teeth, on the inward part of his Thumb, which made a Hole no bigger than that of a Pin, and not seemingly deep, and not discernable, but by a little redness on its Surface, and no sign of that yellow Poison that is sent forth commonly in such a Bite; the Finger swelled not, yet at first there was some Pain; a strong Ligature was made, and the Part scarified, and a Red hot *Spatula* held over the Wound, and often repeated, and ʒii. of *Theriaca* given him in a Glass of Wine.

“ In a little time after the Bite, the Gentleman
“ felt some Debility, he grew pale, his pulse low,
“ quick and interrupted, which were followed
“ by convulsive Motions, and stiffness of the Body,
“ chiefly of the Neck, and Muscles of the Head;
“ great Pain about the Navel, coldness in the ex-
“ treme Parts, and the whole Face, which was
“ covered with a cold Sweat, and his Lips, (espe-
“ cially the lower) swelled; he had a Motion to
“ Stool, *went*, and fainted away; and soon af-
“ ter casting up the *Theriaca* and all his Dinner,
“ undigested; and in regard of his Faintings,
“ Weakness, &c. they designed to give him *Pulv.*
“ *Viperar.* \mathfrak{z} i. in *aq. Therical.* & *Cardui*, and to ap-
“ ply a Plaister of *Theriaca* upon his Heart and
“ Stomach, but he soon ejected this also; he had
“ then given him *Orvietan*, with new Powder
“ of *Vipers*, and he vomitted up that likewise;
“ yet wanted not the use of his Reason, and
“ was put to Bed; and because of his frequent
“ Vomits, whereby he could receive no Bene-
“ fit by what he took, they gave him *Sal Vi-*
“ *perarum*, because by its volability it is quick-
“ ly convey’d to the most remote Parts: Half
“ a Dram of it was dissolved in *Aq. Thericalis*, &
“ *Cardui*: but after a little time he vomitted
“ *this* up also mixed with viscous Phlegm; and the
“ same was repeated a second time with the same
“ effect, and was repeated divers times: Glisters
“ were given him to abate the Pain about the Na-
“ vel, and yet all the evil Symptoms continued
“ very long, but at last by the use of the *Sal Vi-*
“ *perar.* his vomitting ceased; and he kept the
“ eighth Dose in his Stomach; which he took four
“ hours after the *Bite*; and about ten at Night,
“ the most troublesome Symptoms disappeared.

“ He

" He then took a mixture of *Confect. Alkerm.* &
 " *de Hyacinth. aa. ʒi. syr. limon ʒi. & aq. Cardui.*
 " ʒiv. at three times, from three Hours to three
 " Hours, also slices of sugared Citron, and a Pri-
 " san made of *Rad. Scorzon. Raf. CC. Cum. syr. Li-*
 " *mon,* he also took good Broths and Wine, with
 " *Conf. Alkerm.* dissolved in them both. His
 " Thumb was not changed, nor swelled more
 " than at first; and the Pain about his Navil not
 " being gone; Glisters were frequently exhibited,
 " his Belly was a little stiff, but not swelled, his
 " Tongue white, but not drie, his Eyes faint, his
 " Face pale, and his Lips still swelled.
 " That Night the swelling of his Finger ex-
 " tended over the whole Hand, which was an-
 " ointed with *Ol. Scorpion. Matthioli, & aq. Hun-*
 " *gar.* mixed; yet notwithstanding the Tumor,
 " with Pain and Redness extended to the Arm the
 " next day; to which was applied a Fomentation,
 " *Ex rad. angellic. Imperator. Carlin. aristoloch. cum*
 " *summit. scord. Centaur, absinth. Hiperic. Calamint.*
 " *in Vino alb. coct.* and continued anointing with
 " *Ol. Scorp.* yet without any great Effect, for he
 " was squeamish, and once vomitted up his Broth;
 " and continued the same Remedies, both inter-
 " nal and external, and the same Food; and tho'
 " his Pulse was moderate, and his Limbs in good
 " Condition, and without Pain or Drought, yet
 " the swelling about his Navel, and the swel-
 " ling and redness of his Hand and Arm increased;
 " and from the beginning of the third day, it had
 " seized on the Shoulder of the same side, and de-
 " scended to the Arm-pit, upon the whole Breast;
 " and all the neighbouring Parts, and even the
 " whole Region of the Liver, notwithstanding
 " the Fomentation and Oil of Scorpions, which
 " made them fear a Mortification.

“ In the evening of the third day they gave
 “ him ʒi. of *Rad. Contrayerva* in Pouder, in Cordi-
 “ al waters, with *Confect. Alkerm.* but instead of
 “ any abatement, of the swelling, redness or pain;
 “ the swelling seem’d to seize on the left Side, on
 “ which account they again had recourse to the
 “ *Sal Viperarum*, on the Morning of the fourth
 “ Day after the mischief, and after he had taken
 “ it, he was close cover’d, to make him Sweat,
 “ which he did abundantly, and found a conside-
 “ rable amendment, and the ill Symptoms in a
 “ great measure vanish’d: The next Morning
 “ the *Sal Viperar.* was repeated, and he again
 “ Sweat; and the Symptoms more abated, and
 “ the next day and day after that, he took ano-
 “ ther dose of the Salt, which carried off all the
 “ Symptoms intirely, and by the use of a Sicca-
 “ trising Plaister, the Incissions that had been
 “ made on the Part, were healed, in three or
 “ four Days more: And the Gentleman went abroad
 “ about his Business as well as ever.

“ Those that shall read this History, and exa-
 “ mine all the Circumstances of it, the several and
 “ surprizing Accidents of the biting of the Viper,
 “ which we saw, and the effectual Operation of
 “ the Remedies employed to remove them, will
 “ therein find ample matter; to exercise their rea-
 “ son upon, &c.

And he that well observes, what has been said
 upon this head, (tho’ not a great deal) if he is a
 Man of any Ingenuity, can never be at a loss;
 what to do, in this deplorable case, which admits
 of no delay.

But before we close, we think it may be accep-
 table to our curious Reader, to transcribe from the
 Philosophical Transactions abridged, *Vol. 2. p. 813.*
 A Narrative of a deplorable Accident that befel

Mr. Robert Burdet, an English Merchant at Aleppo
Anno. 1678.

Of the Bite of a Serpent.

A Melancholy History of one.

“ THIS Gentleman was bit by a Serpent, on
 “ the left Wrist near the Pulse, towards
 “ his Hand: it seemed at first, like two pricks
 “ of a Pin, he immediately vomited, and his
 “ Wrist and Hand began to swell presently.
 “ He had some few days before, a looseness, which
 “ perhaps this accident increased: He rode easily
 “ after he was bit, about two Miles home, and
 “ as soon as he got to his Chamber, he said he
 “ was bit by a Rat, (and would not own it was
 “ a Serpent) though a Turk accidentally passing
 “ by, said he saw the Serpent hang at his Wrist,
 “ as he pull’d his Hand out of the *Refuge*, hoping
 “ to have taken a Hare, that he had coursed in
 “ there. He said he felt no pain, but a great de-
 “ sire to sleep; his Arm continued swelling up-
 “ wards, and grew black, some little Remedies
 “ were used till the rest of the *Factory* returned,
 “ and then they began to Cup and Scarify his Arm,
 “ he having still no pain, but great drowsiness,
 “ but was kept waking, to use that little time he
 “ had, to prepare himself for death, which he
 “ perform’d exceedingly well.

“ At last the swelling came up to his Shoulder,
 “ and then he complained much, and within a
 quarter

“ quarter of an Hour *died*. He was bit about
“ ten in the Forenoon, and died about three in
“ the Afternoon. His Body swell’d much after
“ Death, and purged : the Snake was like a com-
“ mon Snake for length, his Colour dark and
“ sandy, with black spots : His two Teeth or
“ Fangs, are like those of the Rattle Snake, on
“ the upper Jaw; the Poyson lies in the Gums;
“ and where ever they fetch Blood, of any Crea-
“ ture, they certainly kill, tho’ in some parts;
“ sooner than others : The People of the Coun-
“ trey say, that if, as soon as one is bit by a Ser-
“ pent, they suck immediately the Wound,
“ they may be saved, but they must first rub
“ their Gums and Teeth, with Oil, that none
“ of the Poyson may touch any place, where the
“ Skin is broken, and spit out immediately what
“ they suck, every time washing the Mouth, and
“ taking more Oil. This Serpent killed a Dog
“ in about Eight minutes time, biting him at the
“ end of his Ear, and two young Turkies after-
“ wards, in three or four minutes each, biting
“ them at the end of a Claw : And then we
“ Poyson’d him with the Oil of *Tobacco*, out of
“ a Reed Pipe (that had been much used, and
“ not cleansed; for a Week or two) and he died,
“ in about two or three Minutes, trembling as
“ soon as the Oil was dropt into his Mouth.



Of Contagion, or Infection.

Its Nature.

IF it proceeds from some malignant distemper, it happens in its declension, when the Fermenting Blood is throwing off great quantities of its active Fermentative Particles, upon the Glands, of the most constant and easy Secretion; such as those in the Surface of the Body, and Mouth of the Stomach; by this means the matter of *insensible perspiration*, and the Sweat is impregnated with those *insensibles*; and thus the Ambient Air becomes full of them, so that not only some of these *Effluvia* insinuate themselves into the Blood, of a sound Person, through the Pores of the outward Skin, but also in *Inspiration* thro' the Membrane of the Lungs, and so infects a sound Person.

It is also done, by the Breath of the Diseased Person, especially in his *last moments*, taken in by the bystanders, seizing the Stomach, and fixing a malignity there: And in this case, nothing is so Beneficial as Emeticks timely given, because by their stimulating force, they remove the *Minera* of the Disease.

How the Stomach comes to be thus affected, is by the Fermenting active Particles, of the dying Persons Breath, impregnating the Air, with its poisonous *Effluvia*, as the same is inspired by some sound Person, tainting the Salival Juices, which being glutinous and of a Fermenting nature, are very susceptible of such a Contagion: And the *Saliva* being continually swallowed down, taints the
the

the Stomach, by lodging its Corrosive Salts, in the Secretary Ducts, which thereupon become obstructed, and bring on a dismal train of Symptoms immediately.

And bad Food, unripe Fruit, &c. produce Pestilential Distempers also; for the Juices, with which these do supply the Blood, being corrupted must make a Fluid of quite other properties, than what the *Animal Oeconomy* requires; that is, such as is neither fit for Nutrition, nor for the Secretion of those Liquors, which in the several Organs, are to be derived from it, whereupon the small tubes are obstructed, by a glutinous Slime, which produces Pastules, Inflammations, Ulcers, and many other Diseases.

When active Excrementitious, Saline Sulphureous Humours, thrown off by the Pores, are repell'd and forced back again, into the habit of the Body, they prove dangerous Causticks, as is Evident in the Small Pox, Measles, Purples, Erysipelas, &c. for it returning again, upon the Sensible Nervous Membranes, and *there* being pent up, it acts like a Poyson, and produces various Distempers, and the same happens on suppression of stinking Sweat, from the Arm Pits or Feet, or of Critical Sweats in Feavers, &c.

When the Blood is tainted with some venomous *Miasme*, it is liable to incur various Coagulations, and Corruptions in which, *not only* the Spirit and Sulphur make great Efforts, and force the Blood, to boil immediately, *but also* the mixture of the Blood, is dissolved, and its Liquor runs into parts, from whence the Small Pox is produced.

Of the Small Pox.

AS to the *Origin* of the small Pox they have a *Seminary Connate Principle* to us, proceeding from the Impurity of the Blood, conceived in the Womb, with the first rudiments of the *Fetus*. But the evident cause which stirs these Fermentative Seeds, and brings them into act is threefold. 1. Contagion. 2. The Disposition of the Air, and 3. An Immoderate Perturbation of the Blood, and Humours, and sometimes Fear causes them, from the Particles of the *Miasme*, being conveyed from the Surface of the Body to the Center, and the *Miasme* is a Corruptive Ferment, that inclines the Blood to a depravation. For when the venomous Particles of this *Miasme*, light upon a capable Subject, they immediately stir up *Corpuscles*, like themselves, and innate to us, which being jointed, they *Pervade* the whole Mass of Blood, and make it grow turgid in the Vessels.

If about the fourth day of the Feaver, the most pressing Symptoms abate and red Spots appear; if on the second day of their Appearance, many more are conspicuous, which afterwards grow into Pustules, and are ripened into *Pus*; if about the tenth day after the Eruption the white Pustules begin to grow hard, and afterwards to fall off by little and little; if after the time of the Pocks breaking forth they are soft and separate from each other, are few, round, and only possessing the Skin: If the Sick is brisk and looks with a lively Eye, if the Pustules are full and break of their own accord; if Thirst, Sickness and Fainting go away.

If

If about the eighth day from their first Invasion, the Intervals between the Wheales, which were hitherto white, begin to appear red and swollen; these are all good Signs.

But if there be a malignant Constitution of the Air, if the Patient is Fat and well grown in Years, if it happens in a Plethorick or ill Habit, if any *Viscera* are infirm, if a mighty Thirst or difficulty of breathing attends, or a *Diarrhea*, or *Dysenteria*: If they come forth slowly, or are of the Confluent sort, or if they are hard or attended with Purple Spots, or Bloody Urine, or if the Pocks are livid or green, if when they come forth they wither and are empty, and the swelling of the Parts abate, or if they fall or dint in the middle with black Specks, and if the Feaver suddenly goes off, or any Symptoms contrary to the *foregoing*, they are all very ill Signs, and presage a bad Issue of the Disease.

Next after the *Face*, the *Hands* swell, and the Fingers are distended; the Pocks in the Face, which before were smooth and red, now are rough and (which is the first Sign of Maturation) white, they also cast forth a yellowish matter; the Inflammation of the Hands and Face being now at the height, the Spaces between the Pocks look of a *florid Colour*, and the more florid, the more mild the Pock; and tho' in the Face they grow rougher and yellower, as they ripen, yet in the Hands and other Parts of the Body they grow whiter and less rough.

When the Swelling and Inflammation abate, the Pocks are come to Maturity, which is commonly about the eleventh day, and then they wither and fall off from all Parts of the Body: whilst those in the Face are often succeeded by Pits, and those Pits proceed from the virulence

of the matter, lying long upon the Cutis before it dries, which is because the Face is exposed to the Air, and wants that heat which the other Parts have, and for that reason do not Pit: Therefore to me it seems rational, as soon as the Pustules are full ripe, to let out the matter from all those in the Face, either by puncture, or snipping with a pair of Scissers, and then to anoint them with *Bals. Limacum*, or, *ung. ad foveas*, in *Bates's Pharmacop.* or such like.

Most of those who die of the distinct Pock, do it on the Eighth day, and on the Eleventh in the Confluent kind. And in the first sort, though Sweats are endeavour'd to be procured by *Alexipharmicks*, and a hot *Regimen*, the day aforesaid, yet the Face which should be Swoln, and Inflamed between the spaces of the Pocks, appears then whiteish, whilst the Pocks are red and high, Sweat vanisheth, the sick grows delirious, grates his Teeth, tosses up and down, Urines little, and often, and in a little time expires. The Delirium shewing that the *Animal Powers*, and the sickness at Heart, that the *Vital Powers* are wounded.

In the Confluent kind the Symptoms are the same, but more severe and not such a disposition to Sweat, as in the distinct kind, and before the appearance of the Confluent sort, a *Diarrhea* sometimes happens, and continues for a day or two after, which seldom occurs, in the distinct sort.

The Confluent Pocks, seldom appear later, (but often sooner) than the third day, and the sooner they appear, the more they run into one, and in some Patients, the Expulsion lasts to the Ninth or Eleventh day: And the Symptoms do not so readily abate after the coming out of the Pock, as they frequently do in the distinct sort: Nor do the Scabbs so soon fall off; in grown Persons a *Salivation*,

vation, and in Children a *Diarrhea* commonly attends the Confluent sort. The *Salivation* sometimes begins with the Pock, and sometimes two or three days after; at first a thin matter is spit, but about the Eleventh day, it grows very viscous and is voided with much difficulty; and attended with great danger. For though the Patient is very Thirsty, yet the Cough troubles him so, and his Throat often so full of the Pocks, and Tough Flegm, that it is ready to Suffocate him, and his drink returns thro' his Nostrils.

About the Eleventh day the *Salivation* usually ceases, and now, unless the swelling of his Hands and Face supply its room, the sick quickly dies.

In both kinds, there is a Fever, from the beginning to the first breaking out; from whence to the time of the ripeness of the Pocks, it abates, and then wholly vanisheth away.

My Reasons against bleeding in this Distemper, may be seen in another part of this Book: But instead thereof, I should much rather substitute an Emetick. Keep the Patient not too hot, nor confine him from plenty of good small Beer, into which may be sometimes dropped Spt. *Salis Armoniac* Fifteen Drops and after the Fifth or Sixth day, if need require, you may every night, give the Patient *Diacod.* ʒi to the Tenth day.

And if the Spittle is so viscous that it cannot be raised up, let there be cast into the Throat with a Syringe, a Gargarisme, of *aq. Hord. mel. rosar.* &c. or *Ex Cort. ulmi. rad. Liquorit. Uvar. pass. fol. ros. rub. in aq. font. cum. mel. rosar. &c.*

Give him now and then, Panada, sweetned with Loaf Sugar, Sack Whey, also Posset Drink, Barley

ley Broaths, Apples (roasted and put in or) boiled in small Beer, and if the Pocks come out kindly, and keep so, there will be but very little occasion for Medicines: But if they suddenly sink, fall, or dint in the middle, we must immediately fly to Alexipharmicks for help, and if a looseness attend, *Diascordium* and *Laudanum*, are good assistants.

If Blindness is feared, a Lotion must be used,
Ex aq. angellic. & papaver. Rhead. aa ℥iii S. V. ℥i
Croc. ʒβ fiat. collirium.

If the Throat is sore and parched, make a Gargarisme, (much commended by some) of *Collum-bine* Leaves, boiled in Wine and Water, ℥vi Red Port Wine two Ounces, *Syr. mororum* ʒiβ *misce. fiat. gargarisma.*

About the Twenty first day, give some proper Cathartick, and let it be repeated, (at due intervals) three or four times, and then take away twelve or fourteen Ounces of Blood, and cut a Fontinel in the Arm, which let run for some time, and purge and bleed the next Spring, and fall; as you may the next year following also.

Of Agues.

Their Symptoms accounted for.

THE word *Ague* is derived from the French Adjective *Aigu*, signifying *Acute*, or *Sharp*, because during the *Paroxisme* it affects the Patient with *Sharp Pains*. &c. tho' amongst Physicians, it is number'd amongst *Chronick Feavers*; but that

is

), *Their Symptoms accounted for.* 315
} is rather, from the *duration*, than respecting its
vehemency.

The Reason of the Cold Fit.

It is from the flowing and turgescency of the *Nervous juice* degenerated into another nature, wherewith the Spirits and Heart being charged, abound; and the Nervous Bodies being irritated, are put into a trembling, but afterwards when these are protruded, to the Superficies of the Body, and somewhat freed from their Oppression, they join with the Serum, and evaporate by that Sweat, which succeeds the cold Fit.

The Reason of the Intermission.

It is affirmed by some of good Authority, that the reason of the Intermision between the Fits, and their return is, because the Morbifick matter is all cleared at one Fit, and so till a new one is brought in place, an Intermision of necessity follows, now a new matter (they say) begins to be generated, from the time that the last Fit ceased; And when the Blood is fill'd again, to a *Turgescency*, it boiles and comes to a flowing.

But it seems contrary to reason, that the matter of every Paroxisme, should be generated *de noto*, and that because, 1. If as soon as every Paroxisme is ended, the very essence of the Feaver ceases, for a time, and the Blood returns to an *Apyrexia*, every *New Paroxisme* would be a new Feaver, which can no way be granted. 2. Intermittents commonly run all their times, by degrees, regularly ascending to their *State*, and then gradually
tending

tending to their *declination*, even when no Physician is called in : So that from the observation of the Motion of a Fever, a certain Prognostick, may be made of its state and final Cessation, which would be impossible, were the matter of a Fever generated every day a new : For who could see, when a new generation would cease ?

But before the actual invasion of a *Paroxysm*, the Febrile Ferment, is diffused through the Blood, and united with the vital Spirits ; upon this, the Spirits become clogg'd, by the pendulous clamminess thereof, and remit somewhat of their vigour, to Expansion, and with less brightness, irritate the Auricles, and Ventricles of the Heart, and the Arteries conjoined to them, to contract themselves, for the distribution of the Blood. Hence the free Transpiration of the *Halitus* or steams of the Blood, is more or less check'd, and render'd more slow, and weak, than it ought to be, and from hence proceeds the first, insult of the Cold Fit ; which creeps on, insensibly at first, till by degrees, it Eclipses the vital Spirits, the Pulse growing languid, with chilliness of the Body, paleness of the Face, &c.

The Eclipse increasing, the Pulse is more languid, the Nails become pale, and blewish ; the Extreme Parts grow cold, and all other Symptoms strong and vexatious, and this is the second step of the Cold Fit, which continues a great while, the Symptoms still increasing : However soon after this, the irritation of the vital Spirits, rise up and resist their Enemy, by their *Spontaneous Expansion* and 1. They strive to resist the oppression, caused by the clamminess of the *Febrile Ferment*, and to shake off the clogg by their natural agility ; then the parts of the Blood being slowly and heavily diffused into the Parts of the Body

Body in some degree Stagnate, in the *Avenues* of the Heart and burthen *that*, and the Arteries, and so incite them to make more frequent Pulses, to discharge it: *Then* the *Effluvia* of the Blood, being by intercepted Transpiration, returned by the Veins to the Heart, serve somewhat to excite the Spirits, to discuss a little, of the clammy Ferment, which depresseth them, yet all the irritations are not sufficient to hinder the increase of the Cold, or farther depression of the vital Motion; and it is at *this time*, that the first certain signs, of actual Fermentation of the Blood, shew themselves; for as soon as the certain signs of an Universal oppression of the vital Spirits appear, we may from *that time* date the Commencement of the Fermentation, immediately consequent thereto, because they declare that the Ferment hath actually begun its work.

When the vital Spirits have got the Victory, over the *Febrile Ferment*, the remaining Parts of that Ferment, are commonly by an Universal Sweat, flowing without any considerable detriment, to the Strength, of the Patient dispersed, and exterminated; for this Sweat, is a kind of Dispumation, of the Impurities of the Blood, that caused the Paroxysm, *whereupon* soon follows, a Remission of the burning heat, and all the other train of Symptoms.

When it goes off, and returns once in Twenty four Hours, it is called an intermitting Quotidian: If it recurs every other day, or every *third*, it is nominated a *Tertian*. If it returns after two whole days of intermission, it is then a *Quartan Ague*, and so forwards; for there have been *Quintan's* and *Sextan's* tho' very rarely. *Besides these*, there are other *Species* compounded of *continuals* and *intermittents*; yet *referrible to neither*. And hence

hence they are by some called, a continual *Quotidian*, *Tertian*, or *Quartan*, according to the time of their afflicting *de novo*.

And besides there are others, compounded of two, or more intermittents. As 1. *Double* or *Treble Quotidians*; as when in the same day, two or three *Paroxismes* invade the Patient, successively. 2. *Double* or *Treble Tertians*, believed hitherto to consist of two or three *Tertians*. Whether in a *double*, two *Paroxismes* return in one day, or *single Paroxismes*, return every third day. Or whether in a *Triple*, two Fits come, in one day, and a third on the next day after, or three in one day and none the rest.

An Intermitting Feaver of this sort, is distinguished from a simple *Quotidian*, by the time of its invasion, duration, and Symptoms; for in all these Circumstances, the *first* *Paroxysm*, answers to the *third*, and the *third* to the *fifth*. But the second answers to the fourth, and the fourth to the sixth, and so forward. Whenever therefore, we find this *Analogy* between the *Paroxisms* alternately invading, we may confidently pronounce the Feaver to be of that kind, which Physicians call a *double Tertian*. And on the other side, when we observe that the *first* Fit, is like the second, and the second like the third, and so on, thro' the whole course of the Feaver, we may pronounce that the Patient labours under a simple *Quotidian*.

The *Essence* of a *Tertian* consists in a sharpness, and heat of the Blood, which sets the *Crude* nutritive juice, a *Fermenting* like new Beer, from whence proceeds first a cold shivering, when afterwards, the vital Spirits prevailing, a burning with intense heat succeeds, and then after the *Conflict* is over, upon separation of the *Fluids*,
the

the Serum is sent forth through the Pores, by Sweat, &c.

If a Tertian continues long, it impoverisheth the Mass of Blood, and brings on Jaundice, Scurvy, or *Cachexy*: For by frequent Fits, the Spirits evaporate, the Muscles loose their Spring, and the Strength decays; and by continuance, it often changes to a *Quotidian*, *Quartan*, or double Tertian, which *Emaciates* the Body and brings it to a Skeleton.

A *Quartan* is difficultly cured, because of the *Viscous* Constitution of the Blood, and the *Lentor* therein, which is not easily removed; for there being in it a scarcity and defect of Spirits from its depravity and viscious Disposition, there is need that the whole Mass be volatalized, and spiritualized *a new*. Wherefore Evacuators do no Good but Hurt.

If it remains long, it brings on the Scurvy, or Hipocondriack melancholly, and involves the Patient in an ill habit of Body, all his Life after.

Of the set Returns of the Fit.

This happens for the most part, because the nutritive Juices are supplied from the *Viscera*, to the Blood, passing in the Veins, in an even measure and quantity, tho' sometimes when People gorge themselves too much, or are too *abstemious*, the Fits happen sooner or later than usual. But why the Returns are not of *one kind*, and of the *same distance*, but some one day and some another, is from the different Constitution of the Blood, whereby it is perverted from its due temper into a sharp acid, or austere Disposition; and according to this different *Discrasie*, the nutritive Juice, fresh brought, falls more or less from its maturation, or

is

is perverted into a matter sooner or later, apt to ferment, which nothing clashes with the Reasons foregoing concerning the intermission of the Fit.

If upon the Lips breaking out, the Feaver does not remit, it will prove severe, and of long continuance, but such an Eruption of the Lips is commonly *Critical*, and when the *Jaundice* happens upon a *Tertian* Ague, and puts an end to it, it is because, when the Blood has got a sharp or bilious Disposition, so that thereby it changes the nutritive Juice, it is freed from that *discrasie*, when by a sudden Excretion, the Excrements of the Adult Gall are freely purged.

When a Phlegmon happens upon this affect, it is commonly said, that an Ague is fallen into the Part. Now it is no strange thing that the Disease should terminate by such an Abscess; because the Blood by this means continually severs from it self the store of the degenerate Mass, and Conveys it to the part affected; so the Disease is sometimes helped by a *Metastasis* of the *Febrile Matter*, from one part to another; as a Tooth-ach Deafness, &c. happening on a sudden.

As all periodical Diseases, take their *Origin* from a Disproportion, between the waste and supply of some of the Fluids, so the Cure depends in preserving an equal Ballance between the force of the Solids, and the Resistance of the Fluids, and reducing the Secretions to their natural State.

In *Acute* Feavers, sweating, diluting and lessening the Elasticity, and contraction of the Solids, is the most rational Practice; but in Agues this Method is pernicious; and therefore, in the cure of Agues, we take *Contrary Methods*, and give such Things as contract and increase the Elasticity of the Nerves; and this is the Reason why Catharticks, either *in* or *after* the cure of an Ague are often fatal.

As

As to its cause (amongst others) it is said to be from a relaxed state of the Nerves, and a viscid Blood. The 1. Is caused by a lessening of the pressure of the Atmosphere upon the Body, and a Foggy Air, hindering Perspiration, also want of due exercise, too much Indulgence, either in Bed or from warm Clothes, or sitting too much by the Fire, &c. the 2. Is caused by Food that naturally tends to make the Blood Glutinous, as Fish, and some sorts of Fruits: And from a weakness of the Spring of the Air.

The viscosity of the Blood must first be remedied, before the Sollids are braced, or it will be difficult to bring the Fibres to their due tone, with such a weight upon them: And this is the reason why so much mischief is done by the *Cortex*, by giving it at random before the *Lentor* of the Blood is removed.

The Sollids are Constringed or contracted by Aromaticks, Bitters, and volatile Salts: And the *Lentor* of the Blood removed by Emeticks, which strain and shake all parts, viz. the Muscles, *viscera*, and Extreame Parts, which are thereby squeezed and clear'd of all their viscidities: And then whatsoever is rough, and gently irritates the Fibres, will contract them, and so make a Cure, and this all Subastringents do, especially if they are Aromatick and bitter.

How the *Cortex* cures Agues, the Reader will find under that head, where we have particularly treated of it, to which we refer. But we shall here take notice farther, that after the use of the Bark, the Distemper often returns, and the reason of that is, the *Lentor* of the juices not being first removed, for the *Bark* operating only upon the Sollids, and not making any alteration on the Fluids, (except by chance,) so long as the Bark

is taking, the *Fibres* are braced; and the Fit prevented: But as soon as that is laid by, the *Fibres* relax, and loose their *Tension*, and the viscosity of the Blood not being removed, the Ague returns again in about fourteen days; which is generally a sign of a *Discrasie* of the Blood: And here many times Aromatics, with bitters Astringents and Chalibeats, or other warm generous Medicines will effect the Cure, when the *Cortex* will do nothing *effectually* towards it: Especially where the Ague happens upon a weak *thin Blood*, or makes it *so*, by its long continuance.

Of a Gonorrhœa.

Its Seat, &c.

WHERE the Seat of a Gonorrhœa is, has been along, and *trite* dispute, amongst the Learned. Some affirming, that it comes from a Seminal matter, and that the Seminal Vessels are affected.

Others that the Seed is vitiated, and that the *Parastata* are Ulcerated, or much debillitated: And that, Seed flows, with *virulent* matter.

Others will have it, that the *Prostata*, *vesicula Seminales*, and Testicles, are all equally concerned.

And some again confine it to the *Urethra*; sometimes in one place, and sometimes in another. But for the most part and with reason, as we think it is in the Mouths of the *Glandula Mucosa*, or near them in the *Urethra*.

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The late Mr. Cowper, the *Famous Anatomist*, was the first that discover'd those Glands: And they are in number Three. The first two are about the bigness of a *French Bean*, and lie on each side of the *Bulb*, of the *Cavernous Body* of the *Urethra*, a little above it; their *Excretory ducts*, spring from their internal Surface, next to the inner membrane of the *Urethra*, whence descending about half an Inch, they begin to grow less, and piercing that *Membrane* obliquely, open into the *Urethra*, by two distinct *Orrifices*, just below, its bending under the *Os pubis*, in *perinaeo*, where they discharge a transparent viscous *Liquor*.

The third Gland, is small, *Conglobate*, and Yellowish, like the former, *but less*; Situate, about the Angle of *Flexure*, of the *Urethra*, under the *Os pubis*, in *perinaeo*, near the *Anus*, and hath two *Excretory ducts*, which enter the *Urethra* obliquely, about a quarter of an Inch, below the *Orrifices* of the former, and emit a *Liquor* like theirs.

That it cannot have its Seat, in the *Prostate Vesiculæ Seminalis*, or *Parastate*, (unless by some extraordinary accident) is denied: *Because* it must be conveyed thither, by the subtil *virus*, by the Pores of the *Glans*, in *Coitu*, which cannot be; there being no Vein, to lead the venom from the *Glans*, to any of those parts: And if there were, yet the infection would not appear in a *Gonorrhœa*, but in form of a Pox, from the very first; which it (commonly) does not. But sometimes the *Glans*, and *Prepuce* are beset with Shankers, when the venereal impurity fixes on these parts, without any gleet from the *Urethra*, and does not Infect the Blood, if timely taken, and rightly managed, before the sharp Particles, corrode those tender Parts, too much, and so form deep Ulcers. And tho' by chance, the virulency may fix on the Valves

of the Caruncles, which are placed at the opening of the ducts of the *Prostata*, yet it is not *therefore* necessary, that it *must* fix on the *Prostata* themselves: For as they lie at some distance, from those Caruncles, the malignity must have formed a large Ulcer, before it can come to *them*, and have got into the Blood *also*; and *so* the most distant parts of the Body may be *equally* infected; for those Valves, though they will suffer the Liquor they separate to pass through them, yet they will not suffer any Liquor, to pass through *those Tubes* into the *Prostata* back again.

Or if the malignity was to fix at the Valves of the *Vesicula Seminales*, till the Disease had degenerated into a Pox, and those *Vesiculae* become infected, a *Posteriori*, or that it takes up its residence in the *Parastata*, yet as they lie at a greater distance from the *Urethra*, than either the *Prostata*, or *Vesicula Seminales*; to come at them the malignity must *not only* pass by the *Urethra*, through the Valves, into the *Vesicula Seminalis* (which is contrary to the action of those Valves,) but *must also* take a long Course through *them*, and the *was differens* *also* before it can come at the *Prostata*: And why it should *so* befriend the *Proximate* Parts, it passes through, to fix on those more remote, is a very knotty *Phanomenon*. Or if the venereal venom, could pass through the Pores of the *Glans*, yet the *Parastata* could not be infected by it, till the whole Mass. of Blood was *so*, which cannot be, for the Reasons aforesaid.

The Seat of a virulent *Gonorrhœa*, then, cannot be in any of the Parts assigned to it by many Authors, but in the *Urethra*, and commonly (as Dr. Drake has well observed,) either in the *Ostiole*, of the *Glandula Mucosa*, or near them, somewhere

where in the *Urethra*, but not always exactly in the same place.

It is an Error to think, that either Man or Woman that is Clapp'd, free themselves by lying with a Sound Person; for every venereal act, increases the malignity; nay every erection is mischievous, by distending the *Urethra*, and so enlarging the Ulcer, whereby the malignity insinuates it self more deeply.

Every Woman that Claps a Man, may not be actually Clapp'd her self at that time, because it is possible, that an infected Man, may have lately left some of the *virulent* matter, in the wrinkles of the *vagina*, of a Woman, which has not yet had time to shew it self to her, by any Symptoms, because of its recency; but a new Gallant coming vigorously on, may take it from her, or they may share it between them; the possibility of being infected, not depending so much on the *quantity*, of the malignant matter *inhibited*, as on the *virulency* or *corrosiveness* of it.

If a Woman troubled with a *fluor albus*, is afflicted with it, during the time of her *Menses*, it is a sign she has a *Gonorrhœa*; for a simple *fluor albus* commonly ceases during the Flux of the *Menses*, and returns again when they are over.

As to the Seat of a *Gonorrhœa*, in Women, some are of Opinion, that it is in their *Testicles*, others that it is in the *Vagina Uteri*, and others that it is in the *Fundus Uteri*.

It cannot be in the *Ovaria*, because of their distant situation, they lying near two Fingers distance from the Womb, near the terminations of the *tubæ fallopianæ*, and are fastened to the *Uterus*, by the *vas differens*, as also to other adjacent Parts. Now these *fallopian tubes*, altho' hollow, yet their Cavities are so small, and shut so very close, *post*

coitum, that they will not admit any thing from them. As to the *Fundus Uteri*, it may by accident be the Seat of a *Gonorrhœa*, but not generally so; but rather the *vagina*; that part being very lax and over spread with Mucous Glands, whose tone being hurt, by the venereal Poyson, emits a *Liquor*, and with *that*, a corrupt Humour, which constitutes a *Gonorrhœa*.

Strong Purging, in this mallady, (as is now the common Method) is certainly *male practice*; such Purges, not being capable either to *eradicate* the Infection, or abate its virulency, because the venom lies quite out of the way of *such Operation*, and instead of help, does mischief, by weakning the Sollids, &c. And if it be only a simple *Gonorrhœa* and recent, a continued use of Emollients, and Rheubarb, exhibited at proper intervals, will do a great deal towards a Cure, especially if there be given also daily a Solution of *Bals. capivi*, (or the Balsam mix'd with some proper Conserve,) with some of it injected up the *Urethra*, or some other proper injection, this method will do the business, without all that bustle and noise, that is commonly made, by purging so long that the Parts are thereby weakned, and a tedious Gleet succeeds, of very difficult Cure. But if the Infection appears in worse shapes, then Mercurials and Balsamicks come in as proper Auxiliaries. And an Oracle in the Faculty assures us, that what may most certainly be relied on, are Mercurial Preparations wrapped up in *Camphore*; for want of which, the Mercury operates either in the Intestines, and so passes off as a Cathartick; or else upon the Glands of the Throat, and communicates its Vertues but very little farther; whereas the venereal *virus* commonly lies in the most distant Parts, and infects the smallest Fibres, and Threads quite

quite out of the reach of Catharticks, and indeed of Mercury it self, as it is generally managed, and that's the reason why this Disease, when seemingly cured, for a time, often returns again. But that this inconveniency may be prevented, mild Preparations of Mercury must be given for some time, and so lock'd up, that they may lie long in the Body, without any sensible operation, that is, they shall neither Purge nor Sallivate, but become *Alterants*, and so penetrate the smallest recesses, where the Pocky matter lies, out of the reach of common Medicines; and nothing seems so capable to do this as *Camphore* which by its Oilie, volatile Substance, is capable to soften and volatilize the Acrimonious Salts, and destroy the Pungency (by inclosing the Asperities) of the Pocky matter upon the Fibres, by its conjunction with the Mercury, which by the *Camphore*, is carried quite through the Body, and secured from acting any way, except upon the Pocky *virus*, which when it has overcome, it carries it off, by transpiration; and I am assured, very lately (but have not had any opportunity to try it as yet) that even so rough a Mercurial Preparation as Turbith mineral it self, will pass through the Body, without any manner of operation, if given in a Bolus, or Pills, with *Camphore*, which if it will, is a secret worth knowing, not only for the cure of Venereal Diseases, but of all *Cutaneous* Distempers also.

And the frequent repetition of *Camphore*, at proper intervals with Aromaticks and Sudorifficks, will hardly fail, (even without Mercury) of eradicating the most obstinate Pox, that was ever met with, (as Dr. *Quincey* affirms, and I dare take his word) If joined with a suitable way of living: That is, a softening Nutritive diet, that keeps up the vigour of Digestion, and smoothes the Ani-

mal Fluids: Also by Medicines that are termed Emollient and Balsamick, for these fill up the wasted habit with requisite Substance, and guard the Solids, against the Acrimony of the tainted Humours: now of a quite contrary nature, are Salivation, and all strong Purges, for *these* rob the Constitution of a soft Balsamick Blood, which is, its best defence, and leaves it unable to withstand the attacks of its Enemy, and often brings on a Hectick Fever, and the Patient dies *tabid*. Which might have been prevented with a right management of the Mercury with Camphore, after the manner we just now hinted.

Of the Grand Lues or Pox.

Its Symptoms accounted for.

IT is caused by a sharp Fermenting *virus*, or poyson, of the nature of a *Caustick acid*, differing from all other *acids* (and which is ever replete, with a vast number of poysonous *Animalcula*) on which account it coagulates the humours with which it is mixed, especially the Phlegm; from which coagulation arises hard small Tumors, which are attended with pain, Ulcerate and are hard, on the edges, and hollow in the middle, which are called *Chancres*, or Shankerous Ulcers.

The Ferment increasing, corrupts the adjacent parts; and *hence*, the Blood that is carried, for the nourishment of those parts, by the *Arteries*, receives some Particles of *that* Ferment, and in returning

returning by the Veins, communicates the poyson to the Mass of Blood: Which, by *such accession*, of poysonous Particles; the Blood by *degrees*, becomes sufficiently disposed, for an *universal Fermentation* and Corruption.

And thus from a *Chancre*, or *Shanker ONLY*, may be produced the *Grand Pox* it self; and the Mass of Blood may be contaminated a multitude of ways, according to the form of the *Virus*, or Constitution of the Patient; and thereby may produce different Symptoms, or appear in different Shapes, *viz.* If the Ferment is very volatile, and if the Blood discharges any Serossities, by Sweat between the Muscles, *these* by pricking the Membranes cause *vagous pains*, resembling those in a *Rheumatism*, being painful sensations all over the Body, called commonly WANDERING PAINS.

If those Serossities run along the *Nerves*, or *Periosteum*, the *Virus* extravasates and pricks the Membranes of the parts affected, Nerves and *Periosteum*, and so produces NOCTURNAL PAINS, which afflict the poor Sinner most when he is warm in his Bed.

When those Serossities, so impregnated with the Pocky *Virus*, are *secreted* from the Blood, and strained into the *Pelvis* of the Kidnies by its continual pricking and vellicating the Membranes and parts through which it passes, in continual motion, causes PAIN and WEAKNESS in the BACK and REINS.

If there be a great quantity of the Fermenting *Virus* in the Mass of Blood, it discharges it self upon the *whole Skin* in *venereal Fumes*, Spots, Scurf, Morpew, Scabs, Tetters, Blisters, (which grow quickly hollow, and become Ulcers) and other defedations of the Skin, according to the *then* predominant humour, which being protruded to
the

the Skin, it mixes with the clammy *Cutaneous juices*, fixes them, and lays the *Basis* of a perpetual defilement: Which often proves so stubborn, that neither *Topicks* nor *Sallivation* it self, will remove it.

If the acidity of the *Virus* is such, as to coagulate the Juices in the Musculous, or Glandulous parts of the Flesh, (in any part of the Body) **NODES** are produced.

When the *Virus* meets in some particular parts with the *Succus Ossicularis*, and there coagulates, or thickens it, and by its *viscidit*y causes it to adhere to a Bone, where by the acidity of the *Virus*, new matter is daily *accumulated*, and the magnitude daily increased till protuberances of the Bone are so gather'd and hardened, as to raise hard Tumours, they are denominated *Exostoses*, or **TOPHS**.

And though the Nose is apart, which this Disease seems to have a particular spight against, yet it is one of the last it seizes, and when it does so, and causes Ulcers there, they are called **OLÆNE**.

When the malignity of the *Virus* produces small Tumours about the verge of the *Anus*, they are called *Condilomata*, which when they Ulcerate, degenerate into Cankorous Hemorrhoides, and Warts, and sometimes they chop, and are called *fissuræ* clefts, or chinks.

If the Humour is *very malignant*, producing a Tumour, near the Fundament, larger than the former, and more painful, whether with a small, or large *Basis*, it is called *ficus in ano*.

If the *Virus* is disseminated through all the Body, and all the Juices, with the *Succus pilaris*, which nourishes the Roots of the Hair, are contaminated with the Corrosive acidity, so that it destroys the
Roots

Roots of the Hair of the Head, and causes it to fall off, it is denominated ALOPECIA.

When the Blood Limpha, and Serum, are so coagulated by the *Pocky virus*, that they cannot pass through the *Capillaries*, but spread every where through the Body. Or when that *Virus*, mixed with the Blood, and *Limpha*, passing thro' the Lungs, and there thickening the pituitous substance of that *viscus*, stagnates; where the Pocky acidity being so highly Corrosive, as to cause Ulcers there; in either of these Cases, an Atrophy, Consumption, or wasting of the whole Body is produced.

If the malignity fixes on the Joints, it generates a POCKY GOUT.

When the Fermenting *Virus*, is protruded to the Glands, of the *Emunctories*; chiefly to the Groins, as rather going downwards, and also being nearer the beginning of the Infection, than upwards to the Armpits: I say when this happens, a Tumour is raised called a BUBOE, which is rather Critical, than otherwise, because nature separates the Morbiffick matter, for her own ease; and thrusts it to *those parts*, till the Blood and Limpha are perfectly cleansed, by the *Buboe*, by collecting the matter *there*, and by evacuating it *thence*, (when ready for Suppuration,) by Incision or Caustick. By which discharge, a great deal of the malignity of the Disease, is evacuated, and carried off, from the Blood, &c.

The *Limpha* cannot pass from the Arteries in the Lymphatick Vessels, any otherwise than by the Glands, thro' which it is filtered; so that when *that* and the Blood is so infected, that they coagulate, and stagnate in the Glands, they cause Tumours in the Glands of the Neck and Jaws, resembling

sembling the Kings Evil, and in some Patients multiply to a great number.

The *venereal Virus* being a coagulating *Acid*, and being thoroughly mixed with the Blood and *Limpha*, these altogether circulating through the Lungs, coagulate the Pituitous Matter *there*, which being made viscid, adheres to the side of the *Bronchia, aspera Arteria, and Larinx*, and so cause a **HOARSNESS**.

Sometimes when the *Pocky Virus* being mixed with the Blood and *Limpha*, and by some accident put into an extraordinary Ferment, Nature strives to get rid of her Enemy, and the Pox appears in Pustules and Scabs, breaking out on the Neck, Face, Head, &c. and sometimes the whole Body is in a manner cover'd with *Tettars*, Crusts, and Scabs.

If a virulent *Gonorrhea* be unseasonably stopp'd, or if acts in *Coitu*, with infected Persons be often repeated, the virulent matter by Heat being volatilized and mixed with the circulating Mass, is carried to the Head, and infects the Blood and *Limpha* of that part, which by reason of its nearness to the Original of the Nerves, and the sensibility of those Nervous Parts, cause intolerable Pains in the *Head*, which often breaks out into Boyles, Scabs, and running Sores.

Caries or rottenness of the Bones, is often the sad concomitant of this *nasty Disease*; but this happens most commonly to the Bones of the *Nose*, and *Pallate*, and sometimes to the *Jaw-Bone*, where there has been for a long time, a stinking venereal Ulcer, which by length of time or ill Management, penetrates, and the *Virus* corrupts, and by degrees rots the Bones, and so causes the eating away the Roof of the Mouth or *Pallate*, the falling of the *Nose*, &c. all which are with very great difficulty cured,

cured, nor can these Bones ever be restored, nor will a *Callus* ever grow there, to fill up that loss of Substance.

And in a very inveterate Pox, in time the Bones of the Armes, Thighs, and Legs, will grow carious also; here the *Virus* penetrates the Periostium, Corrodes the Bone, sinks into its substance and pierces the very Marrow, causing most exquisite Pains, and then commonly it sends the poor Wretch to lodge with his Ancestors.

And thus it passes from the Surface, to the Mass of Blood; from thence to the Flesh, and so to the Membranes, Nerves and Bones, although sometimes there may be a Caries of some particular Bone through a particular disposition of the Ferment, and parts of the Body, without those preceding Accidents.

How the *Semen Virile* should degenerate into this Pocky *Virus* is worth our Care to inquire; many Reasons have been alledged according to Mens different Conceptions, but according to what I conceive most rational, it is this, viz.

The seminal Degeneracy or Corruption, is first made in the *Uterus* of a Common Woman, who receiving many different Seeds into it, are often of various and opposite Natures, and Qualities; which however, by their active Force, Potency and Contention, raise a great Heat and Inflammation in the *Uterus*; and keep it up by repeated Acts of Carnality, which greatly agitates and rarifies the seminal Particles, and which by virtue of their Saline Principles, are immediately put into a Ferment; by which the Composition of all those Seeds is corrupted, and so degenerates into this malignant *Virus* or pocky Poison.

I conceive that this ferment operates on an Human Body, as leaven does, when put into Dough; or Yest, when incorporated with New Bear; and
consists

consists of such Principles, as being exalted and put into Motion by addition of other Matter fit for it to operate upon, it changes it into its own Nature, by rarifying the Particles of such Matter, as it seizes upon, and then associating it self with the *inherent Spirits*, they force on the Motion, and compel the *acrid* Particles of the *Virus* farther into those Parts, which are more divided and infected *thereby*; and thus it gets admittance into other Parts, *more remote* and not yet infected, where its Progress and Ferment still increaseth, although all Parts of the Body are infected with the Principles of the first Ferment; for it contains and partakes of *Saline* Motive and vital Principles, fit for Exaltation to the highest acrimony and virulence.

That the venereal Ferment is an *acid*, appears from *hence*; that it condenses and coagulates the Humours, excites Pain, and corrupts the Flesh and Bones, as other Acids do, and that (most commonly) without any Blackness, whereas *that Corruption* which proceeds from *alkalious Salts*, is always attended with blackness; as in the Plague, &c.

Now all Pains proceeding from Acidities, and Acrimony of the Humors; must needs require such things as *absorb* Acidities, and sweeten the Juices, *thereby* giving Ease to those Pains, and of this Class are Opiates, volatile alkalious Salts, and Anodine Sulphurs of Mettals, &c.

As to Diet Drinks, which absorb, alter and sweeten the Blood, and *Limpha*; such People as are fleshy, and fat, are best suited with Drinks made of *Guaiacum* and its Bark, Sassafras with Aromaticks, &c. but such as are Lean, Weak and Consumptive ought to forbear them, and instead thereof use Decoctions of *China*, *Sarsa*, *Rad. Bardan*. Turnips, &c. which not only are esteemed

sweet.

sweetners of the Blood, and *Limpha*, but also restorers of the weak body.

Why *Mercury* is so great a Specifick in the Cure of this Disease, may be seen under that Head, where we have treated of it in *particular*, and shall now only give our Reasons why Antimony is such a constant Ingredient in pocky Drinks. The virtue of Antimony lies in its Sulphur, which *in this case* is like an *Alkali*. The Sulphur of Antimony being like common Sulphur, without an *acid*; it follows that the acid, in our Bodies, by dividing the Antimonial Sulphur into Atoms, does break or blunt its Points, and thereby destroy its own Power; which during the Contest in the Blood an Effervescence is raised; whereby the *Virus* being reduced to subtile Particles, Vapours, or Effluvia's by the sudoriffick Property of the said Sulphur; it is expelled through the Pores of the Skin by sensible, or insensible Perspiration, &c.

As to bleeding in this Distemper, altho' allowed of by many Great Physitians, I hope I may have the liberty of other Authors to dissent from a custom that I do not think *Good*, without incurring the Censure of *Heterodoxy* in practice. It is not *always* running with the Croud, that indicates a Mans being in the Right; nor his being alone in an *Hypothesis*, that proves him in the wrong; but not to multiply Words, I shall give the Reader my Thoughts herein, in the Words of the famous *Blegny* Surgeon in Ordinary to the *French* Queen, in his Observations on this Disease, *Sect.*

2. Cap. 2.

" Some Practitioners, says he, whose Method
 " we must *by no means follow*, ever begin the Cure
 " with bleeding in the Arm, *by which Means* the
 " Venereal Matter will be attracted, or driven
 " more

“ more inwardly into the Body, and *therefore* you
 “ must by consequence suspect it, as dangerous or
 “ pernicious; others bleed boldly in the Foot,
 “ which also has the same Effect, or else it precipitates the matter by Defluxion into the Testicles, for which Reason you ought to abstain from bleeding in either Part, &c.

That it may be got by a pretended Strain of the Back, the touch of an infected Person, and many more improbable ways, has been affirmed by some, that either would conceal their own Shame and Wickedness, or by others, that would impose upon the Credulous; but we know of no way in *reality*, how any Person can possibly be infected with this *loathsome Disease*, except 1. It be *Hereditary*, and so a Child contracts it from its Mother in the *Womb*, or a Child may communicate it *to* or suck it *from* its Nurse or Mother; or, 2ly, A Man or Woman, may get it by impure Imbraces; which way it is *generally* communicated; and I know by Experience, that neither attendance on a pocky Patient, nor Salivating nor Sweating him divers ways, and for many days together, will hurt any person, altho’ if it was to be got from, a Pocky Patient, any otherwise than as above said, The daily poisonous steams, received from such a Patient, would in all probability do it as soon as any thing which yet large Experience, Evinces, *that it will not.*

Of

Of the LEPROSY.

How Propogated and Cured.

AS to the Leprosy amongst the *Jews*, which we read of in *Holy Writ*, that was of such a nature, that it infected their Garments and Household-stuff, and even the very Walls of their Houses, we are at a loss to know of what sort it was: We rather therefore look upon it as a Judgment from Heaven, Inflicted upon and peculiar to, that Stiff-necked People, and therefore shall pass it by in silence.

The *Elephantiasis* of the *Arabians*, was that by which their Physicians commonly understood a Disease of the Feet, where there was great Tumefaction, and the Veins distended with *Varices*, as appears from *Rhasis*, *Avicen* *Avenzoar*, &c. of which see *Fuschius*, lib. 2. c. 16. and *Forestus*, lib. 29. Obs. 27.

The *Elephantiasis* of the *Greeks*, is reckoned a Disease amongst the *Incurables*, or one that is very rarely Cured, and is curiously described by *Aratus*, lib. 2. C. 13. it is with unequal bunching out of the Parts, with thickness, roughness, and chaps of the Skin, resembling the Hide of an Elephant, from whence it receives its Name. And if in the Face, it is called *Leontiasis*.

It is a foul Contagious Cachexy of the whole habit, or according to *Paulus Aeginetus*, lib. 4. c. 2. an Universal Cancer. And *Avicen* says, it is a Disease proceeding from corrupt *Bile*, diffused through the Body, with a hot, and dry Temperament.

rament, of the Bowels, spoiling their Sanguification, and generating this Disease.

It is propagated 1. *Hereditarily*, 2. by *Contagion* in common Conversation, &c. in *Coitu*, 3. *Spontaneously*, by bad Air, and Diet, &c. and others say, that it takes its rise from a Conception, at the time of the Menstrual Flux. But this, as well as the former, being hardly ever seen amongst us, we shall not swell this small manual, with any thing farther about it. But proceed to speak something to that, which is pretty frequent in our Climate, and is known by the name of *Lepra Graecorum*.

And this is also divided into divers *Species*, as 1. *Alphus*, by the Lattins called *Vitiligo*, by the Arabians *Morphea maculosa alba*; in it the Skin is discoloured, here and there, with white Leprous Spots.

2. *Leuce*, and this is when the Flesh partakes of the malignity *equally* with the Skin, the Hair of the Parts affected, changes white, as well as the Skin: And the Parts affected, altho' rubb'd, will not look red, and if prick'd will send forth *only* a watery *Sanies*, 3. *Lichen*, this implies the same with *Impitigo*, and is usually construed to be a *Tetter*, 4. *Psoa*, signifying any Scabby Eruption, attending this Disease, 5. *Furfur* a Scurf, which preying upon the *Cuticula*, raiseth up its *Strata*, and throws the same off like Bran. And when this Scurf affects the Head, Beard or Brows, it is called *Porrigo*, 6. *Rhagades*, chaps or clefts in the Skin, all which distinctions arise, and denominate this Disease, according to the corrosiveness of the *Peccant Humour*, or *vitiated Salts* of the Blood.

This Disease is justly called *opprobrium medicorum*, very few being so happy as to cure it, especially so as not to return, although it happens to be the
very

very milder Species of all: And indeed without Vanity I can say that in more than thirty years practice, I never met with so much as one, that ever was cured of it, except what I cured my self: And I should not Boast, if I should say, that I believe I have had as much Experience of this Disease, and cured as many of it, as any Man in Great Britain, both of the Dry, and Moist kind: The last of which, I do not find that Authors, take any distinct notice of: But I have had, and cured, many of those miserable Wretches, when their Shirts and Sheets, have perpetually adhered to them, and at sometimes tore away the Cuticula, where-ever they stuck, and at other times, the Humour would Condense, into branny Scales, and Shale off, by handfuls, to be found in a Morning, in the Bed, and this sort I always found more easy of cure, than those that were altogether dry.

As to the Cure by Castration, recommended by Valescus de Taranta, Aëtius, and Ambrose Parey, were we sure it would cure, yet there is not a Leper, but would look upon the remedy worse than the disease.

And as to the cure by Viperine, or Mercurial Preparations, (so much cried up) I know by sad Experience, that they never will effect a Cure, whatever some Men may falsely Boast of their Success, in the use of them: And though I have after large Experience, and long Tryals, cured divers Leprous Persons, in a most miserable Condition, yet I ingenuously confess, and am not ashamed to own that I have met with some, (and those not seemingly, by one half so bad, as some of those which I have cured) which I could not cure at all, nor very much help, but there are but few such; for I have had those, that have been cover'd with the Leprous Scurf, and Scabb, from Head to Foot,

as well amongst the Hair, as all over the Face, and other parts, who are living Monuments of God's Mercy, in the use of proper means: And who though formerly were most horribly loathsome to converse with, are now as clear from the Leprosy, and their Skin as smooth and free from any defædation, as a Child new born.

But I beg the Reader to believe, that the great Cures I here mention, were not perform'd (quack like) by *Nostrums*, or by any one particular Preparation, or mixture, but by a rational method, founded upon a Knowledge of the Animal Fluids, and an Understanding of the Nature of their degeneracy and Corruption, and so from thence deduced a proper method of Cure, by an understanding in the *Materia Medica*, and not run blindly on, in the same method; or rather without any method at all, as all such do, who practice by *Recipe's* only. For as in all other Diseases, *so in this*, what Medicines cure one Patient, will not cure another, without great variation; and what cures the *same* Patient of the *same* Disease at one time, (let it be what it will) will not do it at another: And therefore *here* lies the difference, between a Physician, and an Empirick; a rational Practitioner, and a Pretender. And therefore as some Men excel in one Branch of the Art, and some in another, either by more study, or lucky accidents; so I desire in this respect, to be excused, if I a little triumph o'er this loathsome Disease, and glory in the success it has pleased God to give me, in the cure of it, to whom I ascribe the Praise, for so valuable a Blessing.

Amongst the several that I could name, worthy of notice that I have cured, I shall only single out this *one* that follows, the Patient being yet alive and well, and the Witnesses whose Hands are to

the

A Certificate of a very remarkable Cure. 34

the Certificate, most of them alive also; and ready to testify the truth of it: And who voluntarily gave it me as a piece of Gratitude, for my curing the poor miserable Creature whose case I am now bringing under consideration, viz.

Of the LEPROSY.

A Certificate of a very remarkable Cure.

WE whose Names are hereunder written, Inhabitants of the Town of *Luton*, in the County of *Bedford*, do hereby certify all whom it may concern, that ANN CHILD of this Parish, now Aged about Twenty six years, was seized with a Humour in her Head, when about Two years of Age, suppos'd to be a Scall'd Head; which about the Seventh year of her Age, grew worse, and spread it self, and so continued to do, till she was of the Age of Sixteen or Seventeen years, when it degenerated into a Leprosy, and spread over all her Body (her Hands and Face excepted) and in divers Parts, was crusted two or three Inches thick, so that she was extreamly loathsome, and almost incapable to work for her living, or to do almost any thing to support that miserable life, which (by reason of her Leprosy) was become a Burthen to her; having but little to subsist on, but the Charity of well disposed People: And it being for a long time, a moist running Leprosy, which at certain Periods, shell'd off, and return in continual Revolutions (tho' latterly it was wholly crusty and dry) her condition was the

more irksome, painful and filthy. Many Attempts have been made, towards her Cure, and especially for about three or four years, last past, she has been under the hands of divers Doctors and Surgeons, who (for Money that was to be Charitably Collected by her Friends for that purpose,) *all promised her a Cure.* But after long tryals, her Distemper baffled all their Skill, their endeavours proved Fruitless, and they left her worse than they found her, and owned *they could do no more.* And Death seemed to threaten to put a Period to her miserable Life, no hopes of a Cure remaining: When a Friend of hers providentially recommended her deplorable case, to Mr. *James Handley*, of * *Hertford*, in the County of *Hertford* Surgeon, who undertook to cure her *Gratis*, and by the blessing of God, perform'd it, in seven or eight Weeks time; all the filthy Scabbs and Scales falling off gradually, and returned no more, though more than a Year since it was performed, her Body in all parts being very clear, of that filthy Distemper, only her Head is not [altogether] so; but whether that be not some other Humour, that first seized it, at two years of Age, we are not able to determine *exactly*. But all over the rest of her Body, she is as well as ever, and capable to work for her living. And this we testify, in justice to the said Mr. *Handley*, who did so kindly undertake, and so suddenly, and unexpectedly cure her, when *to the Eye of reason*, it seemed impossible, witness our Hands this first day of *December*, 1715.

Tho. Marsom, Sen.

Samuel Chase.

Fran. Stone.

Tho. Burch.

* I then Lived there.

The

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<i>Tho. Marsom, Jun.</i>	<i>Richard Pritchard.</i>
<i>Ann Marsom.</i>	<i>Nathan Marsom.</i>
<i>S. Marsom.</i>	<i>Sarah Marsom.</i>
<i>Will. Pryor.</i>	<i>Abraham Scot.</i>
<i>Mat. Gutturidge.</i>	<i>Edward Green.</i>
<i>Eliz. Gutturidge.</i>	<i>Mary Green.</i>
<i>Francis Hopkins.</i>	<i>Sarah Stone.</i>
<i>Jerem. Okey.</i>	<i>Joan Southen.</i>
<i>Frances Hopkins.</i>	<i>Ann Pretcher.</i>
<i>Mary Okey.</i>	<i>Mary Cooper.</i>
<i>John Cooper.</i>	<i>Joseph Sheppard.</i>
<i>Mary Cooper.</i>	<i>Kath. † Phillips,</i>
<i>John Pritchard.</i>	<i>her Mark.</i>

The above named *Ann Child* maketh Oath, that the Contents of the above Certificate are true.

Jurat coram me

Dec. 1 Anno Domini 1715.

Theo. Napier.

The Mark of *Ann † Child.*

Now from the whole of this case, I would observe, that 1. This Leprosy had been generating no less than Nineteen years, and 2. (though not here express'd) they had endeavour'd to Sallivate her, but with all their Art, they could not raise a Sallivation, nor had the Mercury any effect upon her. 3. She went almost double, and was the sport of the Boys in the Street. 4. It so affected her Head, that it render'd her not only almost incapable to do any thing for her living, but also of understanding or remembring, what she heard at a Sermon: Being a very pious, and religious tho' a poor Maid. 5. She told me since, that the Leprous Scabbs, had crusted about her Loyns, &c. in great Bumps, as big (to use her own expression) as halfpenny Roules, and yet, 6. Notwithstanding

all this, such was the Blessing of God, on a Charitable undertaking, that very soon after she had begun to take my Medicines, she found a sensible amendment: And that day seven Weeks, that she began first to take Medicines of me, she walked over from *Luton* to *Hertford*, to thank me, with a joyful Heart, and had then no remains of her Leprosy, only (as above remarked) a little on her Head, and a small matter on her Legs, which last quickly shell'd off: And if I do not mistake, her Head is now well also, but be that as it will, all her Body is well, and has remain'd so now, about five years, without the least sign of a relapse, she being lusty and strong, and comfortably maintains her self by her own Hands, at making Straw Hats: And though but poor, lives comfortably, and decently, and has the Character, of an honest pious and vertuous Maid, as indeed I believe she is.

I had not said thus much, only to shew that it is not *sometimes* impossible to eradicate those Distempers, which seem so *desperately inveterate*, as to admit of *no cure*, where *proper* Medicines are *artfully* exhibited: And therefore none ought to despair tho' under the most deplorable Circumstances: And farther I must say, that I give no Mercury, nor do I Bleed or Purge the Patient, to any degree worthy of notice, only perhaps at the beginning of the Cure, I cause them to Bleed once, and Purge once or twice and that's all, except during the Cure, I Purge with a proper Cathartick, once in ten days, or a Fortnight, nor has what I give (altho' in divers forms and substances) any sensible Operation, my Medicines in this case, *only* acting as *Alteratives*, upon the vitiated Salts of the Blood, which does more towards the Cure, than all the Mercury, and Catharticks, under the Sun,

as he will find by happy Experience, (as I have done) that will but make trial, by proper Medicines, rightly timed.

Now if I do not acquaint the Reader, what those Medicines are that do such *wonderful feats*, and the method I take in their Administration, I hope he will pardon me: For I not only attained to the Knowledge of them, with much Labour and Industry, but I have Sons that I had rather enrich with the Secret, than Strangers; and Charity (tho' a cardinal vertue) always begins at home, I shall only say, that they are of that sort or kind, that are looked upon with a despicable Eye, by the Generality of Physicians, and very little made use of, in practice: There is very little Pomp in their Preparation, the Mortar rattling more of their praise, than the Furnace blazes, of their excellency: The Pestle bringing them more into a good temper, than either the Reverberatory or Crucible; and in short, they are of a very simple plain Composition, like their Author: And that is all I shall here say of them; and he that will not believe what is said of their effects, must e'en let it alone: And I beg of all such, to study till they find out something better for the purpose; and whoever does so, *Erit mihi magnus Apollo.*

I shall draw to a close on this Head, with relating a case, from a piece of the Ingenious Dr. Daniel Turner, formerly an Ornament to the Profession of Surgery, but now of the College of Physicians in London: Where treating of the Leprosy, in his excellent Book *de morbis Cutaneis*, p. 32. he has this passage. "The worst Species (says he) of this Distemper, and for ought I know, as bad a *Lepros*, as has been seen in our Age, was presented to my view, in a Countrey Man who came to London for advice, and was recommended

ded

“ ded to me, by one of his Relations ; but I not
 “ caring to meddle, he went from me to others,
 “ and at length, to Sergeant *Bernard*, who under-
 “ standing he had tried no Medicine, proposed
 “ a Sallivation, rather than the Bath, which he
 “ had Thoughts of going to.

“ This Person with about a Score more, as I
 “ was informed, fell ill after drinking, some roa-
 “ py and ill brewed Beer, which cost the greater
 “ part of them their lives ; those surviving, in few
 “ Months, grew perfectly Leprous : This Mans
 “ Brother as described to me, was as bad as any our
 “ Authors give account of ; his whole Body over
 “ run with Scabby Ulcers, his Feet like the Ele-
 “ phants, his Fingers and Toes strutting out
 “ with *Rhagades* and quite usefess, his Face with
 “ unequal *Tubercles*, and each morning a Shovel
 “ full of branny Scales cast off in the Sheets.

“ The Person I mention, took his leave of the
 “ Town, only for some little time, till he had
 “ settled his Affairs, in case of death, and that the
 “ season was more suitable, intending shortly to
 “ return, and enterprize the Sallivation, under
 “ mine, or others care, if I refused him.

“ But the next News I heard, was of his Death,
 “ and that (so far as they could distinguish for
 “ the Scabbs) of the Small Pox, a Distemper one
 “ might have believed him, secure of, on account
 “ of his Leprosy.

“ His Brother is still alive, eating and drinking
 “ without Government or Physical Regimen ; for
 “ which Liberty he alledges, his not being better
 “ for his abstinence, and he thinks it scarce possi-
 “ ble it can be worse, whatever freedom he may
 “ take.

“ He is abandon'd by company, making his
 “ own House a *Lazar*, and has none to admi-

“ nister

“ nister to him, what he calls for, but one or two
“ of his own Family.

I remember that in the year 1698, or 99, when I was Surgeon of his Majesties Ship *Looe*, on the Coast of *Ireland*, a poor Irish Woman came suddenly, and fell on her Knees at my Feet, and clasped me about the Legs, and seem'd very importunate with me, for some favour; but she speaking nothing but Irish, I could not understand her request, till an Interpreter explain'd it: (I happen'd then to be a Shore with my Gun, at *Bell Haven*, or *Castle Haven*, in the West of *Ireland*,) and the Interpreter told me, the poor Woman was a *Leper*, and wanted a cure: I look'd on her, and found her so indeed, from Head to Foot, having (as I remember) not one place free, so big as to lay the end of my Finger on: I caus'd her to arise, and promis'd her what help I could afford her, accordingly I caus'd her in the first place, to be Blooded, and then gave her some Medicines to take, not expecting any matter of Success in such a desperate case: And we sailing away, I did not see her again, till about six Weeks after, when to the very great amazement of my self, and every body else, her Leprosy was all gone, and her Skin as smooth and clear, as a Childs; having not the least footstep of the Distemper remaining. I found her in her Hut, where she lay upon Straw, having no manner of Furniture, except a Pottage Pot; she desired my acceptance of a Hen, by way of Gratitude, which I refused: But they told me she would every day, pray to the Virgin *Mary* for me, which for ought I know, she might do, out of her blind Zeal: But such Prayers, and the *Hen*, were both, things of little value, in my Account; but I hope I shall not forget to Adore that God,
that

that gave a Blessing to the Means I used, for her Recovery.

Of the NON-NATURALS in General.

Physicians reckon them to be (in number) six, viz. 1. Air. 2. Meat and Drink. 3. Sleep and Watching. 4. Motion and Rest. 5. Retention and Excretion. 6. Passions of the Mind.

1. *The Air*, is of great Efficacy, as well in the preservation of Health, as in the cure of Diseases, and it chiefly affects us, when it either assists or hinders perspiration, by its *admission*, or *retromission*, and it *so* affecteth the parts, through which it passeth, that it either opens or constipates the Pores, according to the quality it was in when received.

Now when it is *too hot*, it hinders Perspiration, by dissipating our heat; and if *too cold*, it hinders the Passage of the Vapour by Constipation of the Pores. And if *too moist*, it fills up the *Spiracles* of the Skin.

As for the rest relating to this Subject, we refer our Reader to that Head, where we have particularly treated of the Air, in this Book.

2. *Meat and Drink*, the whole necessity of which, depends upon Perspiration: for if nothing was conveyed, and dispersed by the Pores, there would be no need of *Aliment*; but it was given, that it might supply matter for Perspiration.

Bread

Bread and other things of a Fermentative Nature, are accounted the best Food, because by their Ferments, the other Eatables are reduced into Subtiler, and more Spiritous parts, and so are they easily raised into Vapour, and perspire; and for this Reason, we eat Bread with other Victuals and the newer it is (if once cold from the Oven) the better it is, because with it's age, it looses it's Ferment, and therefore whilst new, it is the most proper to be eat, with the Flesh of Animals, and with all Plants and Fruit, which are apt to stop the Ferment of the Stomach, if not assisted with Bread. But we have treated more largely of this matter, in other parts of this Book, where we have treated of Food in general.

3. Sleep and Watching: For we relieve the Body by Sleep, not only because the Animal faculty is at rest, but because the heat drawing back, and returning to the inward parts, better digests, attenuates, resolves, and disperses the subtile Fluid, through the Skin; *unde Viscerum depuratio, & alacritas emergit.* In the time of waking, the Spirits transmitted to the Circumference, Efficaciously dissipate the excrementitious Humours from the external Parts, from whence comes that alternate vicissitude of Sleeping and Waking, that by *the one*, the internal Parts, and by the other the external, may be unloaded of their depraved Juices.

4. Motion and Rest: The Advantages of which, are principally as they contribute to the helping on perspiration; for the Body dull'd with too much rest, quickly complains of a weight, and Laziness of it's Members, because of the small agitation of the Spirits: And so there happens a less dissipation of the Humours, which then, for want of being discharged, press upon the tendinous Fibres,

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bres, of the Muscles, which produces that pain and weight, which we complain of, by sitting or resting so long, without Motion: But exercise stirs up the heat of the Parts, and procures a resolution and discussion, of those excrementitious Humours, which before loaded and oppress'd the Parts, yet if motion be too immoderate, it makes too great a resolution of those juices, design'd for the nutrition of the Parts, which upon a violent expense, languish, till rest restores them to their former vigour.

5. *Retention and Excretion*; and these no less, have regard to the advantages of *perspiration*, than the former; For the several Ferments respect *that*, as their ultimate end, and the *Chyle* being elaborated and wrought up, by the alterations it has received, becomes united and *homogene* with the Blood: The only Intentions of those Ferments, being to render it a proper Vehicle, for the nourishment of every part, so that the separations of excrementitious and *immiscible* Parts, are made in all the several Fermentations and digestions, where the perspiration is facilitated, by subliming the Grumous, and Balsamick parts of the Blood, into volatile Spirits, which are discharged by perspiration.

The exclusion of the Excrements by purging, are thought so useful, because they give a greater Liberty and Freedom, for a farther discharge and separation of the Fluid, by the Secretory Ducts of the Glands; by making the Vessels less turgid; and so allowing the Humours, a free *egress* to exhale. But the method of Perspiration is reduced to the government of the things, excluded and retained; not that it can be contained in such strait Passages, for indeed it is denied through all its Species, but because it has this in common with
other

other Evacuations, which depend upon the expulsion of the Excrements.

6. *The Passions of the Mind*; these are of great force, in the command and government of the Body, whilst they are capable of promoting or hindering perspiration, by the many Commotions, they occasion in the Spirits; so Joy refreshes us, because the Spirits move more briskly, and excite a greater heat through all the Parts, by expanding those Particles, which diffuse themselves immediately through the human Frame: And sadness or sorrow, produces the contrary: Thus we have a short Sketch of the Non-Naturals; and shall proceed no farther, because we design brevity. But the curious on this Subject may consult Dr. Cole in his Dissertation, *De Perspirat. Insensibil. Materia & Peragenda ratione.*

Of the Air.

A short Mechanical Account of it:

THE Air is a *compressible* and *dilatable Fluid*, covering the Earth and Sea, to a considerable height: And the lower parts, being always more compressed than those above; the Spaces into which, it may be compressed, are always *reciprocally proportional*, to the compressing weight.

The *Specifick* gravity of the Air, to Water, according to Mr. Boyles Experiment, is, as One to a Thousand, but according to Dr. Hally and Sir Isaac Newton, it is as One to Eight hundred, and the

the density of Mercury to Water, being as Fourteen to One, the density of Air to Mercury will be as One to Eleven Thousand Two Hundred. So that the Air we breath in, takes up Eleven Thousand Two Hundred times the Space that the like Quantity of Mercury would; and yet Mr. Boyle hath found by Experiments that the Air without any *adventitious* Heat, may by the force of its own Spring, possess Thirteen Thousand times the space it doth, when press'd by the *incumbent Atmosphere*; and therefore may possess a space one Hundred and Forty five Millions and six Hundred Thousand times greater than the same weight of Mercury: And by the addition of heat, it may be made to fill a space, much larger: Now, if we consider that the Air we breath in, may be compressed into Forty times less space, than that which now it fills, it may then possess a space, five Hundred and twenty Thousand times greater at one time than another.

It is only the Air, which by its weight and spring is able to dilate the *Trachea*, and puff up the little Air Bladders, whereby the sides of the Blood Vessels are drawn asunder, and Room made for the Passages of the Blood thro' the Lungs, without which it could not circulate, thro' the Body, and so the *Animal* would die.

Air either too dense, or too thin, is unfit for respiration and consequently unhealthy. For *extream high Mountains* and *very low Vallies*, are equally unwholsome.

Our Bodies are equally compressed upon, by the *incumbent Atmosphere*, and the weight they sustain, is equal to a *Cylinder* of Air, whose base is equal to the *Superficies* of our Bodies: Now a *Cylinder* of Air of the height of the *Atmosphere*, is equal to a *Cylinder* of Water, of the same base and

and Thirty five Foot high, so that every Square Foot of the *Superficies* of our Bodies, is press'd upon by a weight of Air, equal to Thirty five Cubical Feet of Water. And a Cubical Foot of Water, being found by experiments to weigh Seventy six Pounds of Troy weight, *therefore* the compass of a Foot Square upon the *Superficies* of our Bodies, sustains a quantity of Air equal to two Thousand six Hundred and Sixty Pounds weight, and *so many* Feet Square as there is upon the *Superficies* of a Body, so many times two Thousand six Hundred and Sixty Pounds weight, does *that Body* bear. So that if the *Superficies* of a Mans Body was to contain Fifteen Square Feet, (which is pretty near the truth) he would sustain a weight equal to Thirty nine Thousand nine Hundred Pounds Troy.

Now the difference of the weight of the Air, at different times, is measured by the different height, to which the Mercury is *buoyed* up in the *Barometer*: And the greatest variation of the height, of the Mercury, being three Inches, a collum of Air of any assignable *base*, equal to the weight of a *Cylinder* of Mercury, of the *same base*, and the *altitude* of three Inches, will be taken off, from the pressure upon a Body of an equal *base*, at such times as the Mercury is three Inches lower in the *Barometer*: So that every Inch Square of the Surface of our Bodies, is pressed upon at, one time, more than another, by a weight of Air, equal to the weight of three Cubical Inches of Mercury. Now when we consider this, that our Bodies are press'd upon, at one time, more than another, by a weight of a Tun and half, and that this alteration is often very sudden, it is *very amazing*, that every such change, does not tear the Frame of our Bodies to pieces, and one would

be ready to think, that when *so many* of the Vessels of our Bodies, are straitned by an increased pressure, that the Blood would Stagnate, up to the very Heart; which not being able to contract it self, the circulation would cease, and we *immediately die*.

But herein appears the contrivance of *infinite* Wisdom, that when the Resistance to the circulating Blood, is greatest: The *Impetus* by which the Heart contracts, is *so* too, and the Air contained in the Blood, is always in *Equilibrio*, with the external Air, that presses upon our Bodies: So that if the Compression of the *Circumambient Air* be ever *so* little abated, the Air contained in the Blood, unfolds its Spring, and forces the Blood to take up larger space than it had before; and it will be rarified into twice its Dimensions, in the *exhausted Receiver*. And this is the *only* way that the Operation of Cupping-Glasses can be accounted for.

All the Changes that happen, either by Heat or Cold, to Fermenting Liquors, are caused by the Alteration, of either the *Gravity* or *Spring*, of the Air: And it's for the same Reason, that *some People* by their *Pains*, are *so* often *Weatherwise*. Their Blood being more rarifi'd against *Wet-Weather*, or high Winds, will more forcibly press the *Sensible* Membranes, whereby Pains will be felt, which they felt not before.

If the Air be too hot, especially if moist withal, it disposes to malignant Feavers; and if the heat be *excessive* (altho' without Moisture) it produces *diary Feavers*, and *sometimes*, what the Antients call *putrid*. Perspiration being too great, the Humours must remain *viscid* and dry, and *so* unfit for Circulation.

The Air being filled with Vapours, its *Elasticity* is weakned, the Fibres of the Body are relaxed,
and

and the Pores obstructed; which will make the Blood apt to deposite a *Slimy Lentr*, On the sides of the Capillary Arteries, and Orrifices of the Glands, which will be apt to produce *Agues*, and more especially, if Cold be added to the Moisture of the Air, for Cold binds up, and makes the Blood more *Compact*, whereby its Motion becomes *Slower*, and its viscosity *greater*, and so produces this Distemper.

In *excessive* Cold Weather, the Weight and Spring of the Air, are both augmented, and the tone of the Lungs being very much weakned in a *Consumption*, the Air-Bladders must be extended to *Excess*, that the Blood may circulate freely thro' the Lungs, and so produce tickling Coughs, *Pleurisies*, *Peripneumonies*, &c. *Perspiration* being hindred by the Cold, the Quantity of Blood will be increased and pass the Lungs with more difficulty, and the Passage of the *Serum*, thro' the *Cutaneous* Glands being stopp'd, it sollicit those of the *Intestines*, and so is apt to produce a *Diarrhea*. But if Entrance be refused *there*, the Legs swell, the Patient grows Asthmatick, and is in danger of *Death*.

The Air is more or less stock'd with Vegetable, Animal and Mineral *Effluvia*; For by what Means soever a Body becomes divided: yet when some of its Particles become less than the compounding Particles of Air, they will be lighter, and so be elevated into Air, until by their *Coallition*, their Gravity is so much increased, as to sink them towards the Earth again.

Mr. Romer from his Observations on the *Eclipses* of the *Satallites* of *Jupiter*, makes appear, that Light is not above ten Minutes in its Passage from the Sun to us; now, since the Earth is at the least Ten Thousand of its own Diameters from the

Sun, therefore the Light must run at least a Thousand of these Diameters in a Minute; which is above a Hundred Thousand Miles in a Second of Time: And if a Bullet moving with the same *Celerity* as it leaves the Muzzle of the Canon, requires Twenty five Years to pass from the Earth to the Sun, (as has been Mathematically computed) then will the Velocity of Light, to that of a Canon Ball, be as Twenty five Years is to Ten Minutes; so that the Particles of Light, move above a Million of times faster than a Canon-Bullet.

Now by this *Celerity* of the Suns Rays, such small Particles are *fled* off from the most *Sollid* Bodies, as are (when separated,) much lighter than the least Particles of Air, and by the swiftness with which they are reflected, they will be enabled to carry into the Air, such small Particles of Matter, as are really heavier than the Air; which when the Force decreases, and becomes less, than will carry them higher, they fall down again, towards the Earth, and variously affect our Bodies, both in their *Ascent*, and *Descent*, according to their Natures.

And hence it is, that Diseases are more frequent in Cities and Camps, than in a Serene open Country, for filthy steams, that are raised up into the Air, (of what sort soever) must so load the Air, as *very much*, to increase its Gravity; and thereby render it unfit for *Respiration*, and dispose the *Man* to all those Diseases, that proceed from a *viscid* Blood; as Agues, Bloody Fluxes, malignant Feavers, &c.

Salt workers are commonly *Cachectick* and *Dropical*: *Miners* are subject to Asthma's, Consumptions, Palsies, Pains of the Joints, &c. and (in particular) *Lead* gives *Palsies*, and *Collicks*: Those that

that work on *Copperice*, are *Asthmatick*; *Mercury* Miners are subject to *Palsies*, *Vertigoes*, and *Hectick Feavers*; For *Mercury* being entered the *Mass* of *Blood*, rarifies and dissolves it; for it being ten times as heavy as the *Blood*, every Particle of it, will have ten times the force to dissolve the *Blood*, as a Particle of *Blood*, of the same magnitude would have; and hence an Ingenious * *Author* tells us, that in removing *Obstructions*, if the *Blood* be assisted by a considerable Quantity of *Mercury*, it will be able to do as much in one Day, as in three Years if unassisted.

The *Blood* thus rarified by *Mercury*, will stretch the sides of the *Arteries* beyond their Limits; and so the *Carotid Arteries*, will press upon the *Optick Nerves*, and shake them a little out of their Places: So that its no wonder, if *Mercury* Miners are vertiginous, and by this *Rarification* of the *Blood*, the *Arteries* may so press upon and straiten the *Contiguous Nerves*, that the *Passages* of the *Spirits* thro' 'em to the *Muscles*, may be so *Obstructed*, as to leave a *Tremor* or no *Motion* at all: For *Mercury* making the *Blood* very *flexile*, and scouring the *Glands* very *furiously*, the *Nerves* and other *Sollids* become too dry; the *Motion* of the *Spirits* is obstructed, and so the *Motion* of the *whole*, or of *part*, (and sometimes *Sense* also) is taken away at once. And farther, if in any *Artery*, there is received so much *Mercury* that its *Weight* is able to resist the force of the circulating *Blood*, and the *Muscle* in which the *Artery* terminates, has thereby its due supply, of *Blood* cut off; that *part* must loose its *Motion of course*. And this is evident, if we make a *Ligature* upon the descending

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Trunk of the Great Artery of a Dog; he will not be able to move his hinder Parts, and the same thing may happen in *Nerves*, whereby the Spirits are obstructed, so that it's easy to conceive how *Mercury* may produce a Palsie, even by filling the Air with its poysonous *Effluvia*, and so be taken in by the Lungs of the *Miner*, to his great hurt.

And here it may not be much out of the way, to recite what Dr. *Gibson* has long since left upon Record, where treating of what parts of a *Fetus* in the Womb differ from those of an *adult* Person in his *Anatomy of human Bodies Epitomized*, Chap. 34. p. 224. and mentioning the Lungs of a new born *Fætus*, particularly he says, " They are so dense
" and heavy, that if one throw them into the Wa-
" ter, they will sink; whereas if the *Fætus* be but
" born, and take only half a dozen Breaths, they
" become so spongy and light, that they will
" swim; which by the way, may be of good use
" to discover whether those Infants, that are
" kill'd by Whores, and which they commonly
" affirm were Stil-born, were really so, or no.
" For if they were Stil-born, the Lungs will sink,
" but if Alive (so as to Breath ever so little a
" while,) they will swim.

Of Food in General.

And Exercise.

WE may Eat so much, as Hunger may not be troublesome to us, and no longer; yet
Hypo-

Hippocrates says, that the Consequences of a *too slender Diet*, are more fatal, than of one more plentiful, Aphor. 5. § 11.

Sanctorius seems to be of the same Mind, Aphor. 15, 16, 32, 33, 40, and 44. Tho' certainly Excess is to be avoided, for that is often attended with pernicious Consequences.

As Men of *unactive Lives*, have not such a waste of Spirits as others, so their supply need only be answerable to *that*: And tho' Men of a spare Diet (if not *too small* in Quantity) commonly live longer than those that are more gluttonous, if their labour be not *excessive*; so Men of a pale Complexion live longer, than those that are more *florid*: And those with a low Pulse, rather than those that have strong ones; and the Reason is, that the Humours of the *last* are more *volatile*, and so more susceptible of any Impressions, from external Agents; their Solids also, are more *tense*, which will make their *Vibrations* more quick and strong; and so *dispose* to inflammatory Diseases, and they will be more subject to break, by their greater tensify, and will be liable to a more speedy decay, by their greater Motion.

Those that use most Exercise, should Eat and Drink *more plentifully*, but Men of *sedentary Lives*, the *contrary*; not but when by long and intense study, the *Meninges* and other Membranes, have been too long upon the *stretch*, a Glass of Liquor, in pleasant Company *ad hilaritatem*, is attended with great Advantages.

Those that indulge their Appetites to *Excess*, can have no better Remedy, than violent Exercise, if the Strength will bear it; for Drunkenness is attended with all the signs of a general relaxation of the *Fibres*, as *Stammering*, *Staggering*, Relaxation of the *Cornea*, dilatation of the *Pu-*

pilla, &c. disposing the Body to Dropsies, Jaundice, Appoplexies, Palsies, &c. which nothing sooner restores, than proper Exercise.

As to Food, the quantity is *too much*, if after it the Stomach is so distended as to cause Uneasiness, and by its Pressure on the *Diaphragma*, and the *Ascending Trunk* of the *Aorta*, and the *descending* one of the *Vena Cava*, a difficulty of breathing is caused, and when the Passage of the Blood thro' those Vessels, is thereby obstructed, and a greater Quantity than should be, is forced upwards to the Head, obstructing the Passage of the Spirits, thro' the *contiguous* Nerves, and so causes sleepiness, &c.

An healthy Man, should always rise with an Appetite, and not so Eat as to unfit him for Labour or Study.

Food from Animals, seems the best adapted to recruit wasted Strength, and supplying the loss our *Fibres* sustain by daily Motion: Because it consists of Parts which have heretofore been applied to the *same use*; and it is observable, that those Animals that live upon Flesh, are more strong than any others.

And Hot Sallads and Roots are most proper, where Meat is most beneficial.

When the *Fibres* of the Stomach are too lax, and its lining clogg'd with viscid *Phlegm*, then Sollid Food is best.

But when the *Fibres* are too springy, and the slimy *Mucus* is worn off from the internal Coat of the Stomach, then liquid Nourishment is preferable.

Compound Food is not so wholesome as that which is more Simple, nourishing, and easy of Digestion; for there being such vastly different Degrees of *Cohesion*, in the ingredients of which

made

made dishes are compounded, must needs make the Digestion, or Dissolution of it, into such Parts as are small enough to enter the *Lacteals* more difficult.

The Quantity to be Eaten *at a time*, and the time *when* most proper to Eat, is not to be ascertain'd, to *every ones* Constitution but its *best* at such convenient Seasons as that the Food last taken in, may be digested before we Eat any more; and we should both *sit down* to Meat and *rise up* from it, with an Appetite——And as to the time, *Sanctorius* limits it as the *best*, to about three Hours after rising in the Morning, and four or five before going to Bed, Aphor. 57. § 1. for upon *Waking*, the Body being put into a contracted State, if any remains of the last Meal, are either undigested in the Stomach, or not enough attenuated, in the Veins and Arteries, or cleaving to the Orrifices, of the *Excretory Vessels*, it will (if not disturbed, by eating and drinking) *so* increase the celerity, of the Motion of the Blood, and the *Vibrations* of the Vessels, as not only to digest the remaining Food, and *thin* what is too *viscid*, and force out what lies at the Orrifices of the *Glands*, and when this is done, 'tis the fittest time to eat again; and this happening most commonly, at the time aforesaid, Perspiration ought not to be prevented by eating *sooner*: But this is not a Doctrine, that suits every Constitution; but in the general, we may affirm, that we ought to eat at such distance from *Bed time*, that Digestion may be nearly finished before we Sleep: *Digestion* being perform'd by *Contraction*, as *Nutrition* is by *Relaxation*; and Sleeping soon after eating, making a more viscid *Chile*, by giving way to a too early *Relaxation* which drives the *Chile* too soon into the Blood, by the Relaxed

Orrifice

Orrifice of the *Lacteals*, the consequence will be, *all* those ill effects that Blood *too viscid* can produce. But that is commonly the best time for eating (for Men of a regular Life) when Nature calls for Food, which it commonly does, in healthy Persons, at certain Seasons, that are daily appointed for eating.

Hunger puts the Body into a contracted State, as eating relaxes it: And the *Relaxation* is in proportion to the Pleasure in eating, and that is, in proportion to the Hunger. The force of the Stomach when a little Food is in it, is *greater* than when it is *very full*, and therefore, when too much *gorged*, it is most incapable to digest its Food; its Fibres being *then* overstretched, it has (for a time at least) lost its power of pounding the Food, and till *that* is done, it cannot be digested; and if it be *too long*, in Digestion, the *Chile* becomes *too viscid*, its Motion thro' the *Duodenum* slower, and the Orrifices of the *Lacteals* become *wider* (for the present) by this *Relaxation*, by which the *Chile* in too viscid a *Texture*, will be carried into the Blood, which will require more time and labour to make it fluid, and fit for nourishment: Besides, the Stomach being *too full*, and the Fibres relaxed, the Food will ferment, and swell it more, and cause an uneasiness, and hinder Perspiration: and, by this means, too great a quantity of *Chile*, being pour'd into the Mass of Blood at *once*, must needs occasion a *general disorder*.

And whatever the custom of the *French* may be, who love to have their Flesh *very stale*, and rotten roasted before they eat it; that Flesh is certainly the best for Nourishment, that is but lately kill'd and *so dress'd*, that the Gravy may follow the Knife, for otherwise, it both looses its
fine

fine volatile Parts, and contracts *insanative*, malignant Particles, from common Stenches and impure Air, which can be of no service to the animal Fluids, but rather fill the Body with Diseases: Therefore to conclude this Head, we shall repeat what that great Physician Dr. Baynard in a witty Verse has long since left upon Record.

*Drink what is Clear,
Eat what is New,
Conceal what you Hear,
And Speak what is True.*

Of BREAD.

Bread, because of its *fermentative Nature*, reduces other eatables in the Stomach, into more Subtile and Spiritous Parts, and so being render'd fine and light, are easily raised into Vapours and *perspire*: And if it be but *quite cold* after it comes out of the Oven, *the newer the better*: For it looses its ferment, by its Age, and therefore, *when new*, it is the best to be eaten with the Flesh of Animals, and with all Vegetables which stop the ferment of the Stomach, if not eaten with it. That which is most baked, is easiest of Digestion, *because what* the Heat does in Baking, forwards that *Communion* of the most *viscid* Parts, which is to be finished in the Stomach.

The Salt and *Yeast*, or Leven which is added to it to give it a gentle ferment, very much assists to the same end: And Coarse Bread, is a good Change to such, who live upon Meats too *nourishing*,
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ing, it being of an absterfive Nature, and apt to Purge such Persons.

Bread is the most nourishing of any vegetable Food, and that made of Wheat is the *best*, and most nourishing, especially if the Bran be all taken out; *but then* it's not so easily digested, and it also inclines to Costiveness: the better it is *fermented*, the more easily it digests, Fermentation so dividing the Parts of the *fermenting* Mass, that it saves the Stomach, much labour in pounding what it receives ready *fermented*.

Rye, Oaten, and Barley Bread, are best for Persons of a Robust Constitution, and whose Fibres, are too *tense*, and whose Blood mostly abounds with alkalious Salts, *because* in Distillation they afford a considerable Quantity of Oil and Acid; and *therefore* they relax, and soften the over-Tense Fibres, and blunt and correct, *acid* alkalious Salts in the Blood; and *thereby* become useful, in the Leprosy, and other cutaneous Distempers, as well as in Pleurisies, Rheumatisms, &c.

Of HONEY.

THat which is Whitest, and Hardest, is most preferr'd, but the Browner and smoothest, is best in Medicine, *because* not so apt to *Cand*: Besides, it is more Spiritous, which keeps it more fluid; it is Penetrating and Deterging, and highly promotes Expectoration, in all cold Constitutions; but in thin hot Habits, it is often pernicious. Those that are troubled with thick Phlegm,

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in a Morning, may take it on a Toast, or dissolved in warm Liquor, when going to Bed; over Night so taken, it wonderfully helps Expectoration, and all disorders of the Lungs, &c.

Of MILKS.

They are very proper to alter a thin sharp Blood, into a *Craſis* more Soft, Nutritive, and Balsamick, in Constitutions where they agree in the first Passages; because Milk is already prepared into nourishment, so far as is required for its admission into the Blood. All that is done in the *Primæ Viæ*, to our common Food, is but reducing it into *Chyle*, which is a sort of Milk: But where the Glands of the Stomach, are overcharged with sharp Juices, Milk is but too apt to turn to a Curd, which sometimes is with much Difficulty voided by Stool; and therefore, it is commonly and wisely ordered with the *Testacea*, in Milk Courses, in order to destroy those Acidities.

As for the difference of Milks, (notwithstanding the common Creed of the good old Women) that of Cows, seems to be of most substance, and most Nutritive; but Asses Milk, thro' a prevailing Custom, being look'd upon as the last resort of the *Consumptive*, the Physician often finds his Account in it, at the same time; because if his Patient dies, in that Course, he comes off with Reputation, or at least without a slur, because the Patient died *secundum asinum*.

People being so wedded to an Opinion of its Vertues, that if the Patient dies in the use of it, they

hey think no other Means could have saved him ; however if there be any thing extraordinary in its use, it is best taken warm from the Animal (whether As or Cow) and drank immediately, before it looses its natural balmy and volatile Gas, and it is likely that its Vertues arise more from the kind of Food the Animal eats, than from the Animal, it self.

Of W H E Y.

IT is a great cooler, and sweetner of the Blood ; the most viscid part of the Milk is gone off with the Curd, and leaves the Whey fit to pass the more freely, by the common strainers of the Body, particularly the Kidnies, by which it is very apt to pass, if drank *in large quantities.*

Of B U T T E R.

BY its Texture, and the Nature of its substance, it inclines to relax the Sollids, and supplies the Juices with Particles *adhesive* and light ; and therefore is proper in dry, costive Constitutions ; but must be bad in Lax, Moist, and Corpulent ones ; also by its Levity, and tenacity, it is apt to stop in the Glands and Capillaries, and so to foul the Viscera, and particularly the small Glands of the Skin, and to procure Lice, Blotches, and cutaneous Eruptions, especially in Children.

Of

Of CHEESE.

WERE it not for the acid of the Rennet, which makes it Warm, Biting, and easy of Digestion, and Commintion, Cheese would cause the same Inconveniencies as Butter: that is accounted wholsomest that is strongest of the Rennet; tho' all sorts of it are bad in a viscid State of the Blood, and particularly, in Distempers of the Breast, as Pleurifies, Asthma's, &c.

Of EGGS..

THEY are of Good Nourishment, and Warm, but because of their tenacity, and difficulty of Commintion, especially if made hard in dressing, they are apt not to pass well thro' the Stomach; therefore the Custom is laudable to eat them with Vinegar and Pepper, because these things astringe the Coats of the Stomach, and thereby the sooner assist Digestion.

Of RAISONS.

RAisons of the Sun are best in Thirsty Feavers; because they quench Thirst, have a fine Tartarous acidity mixed with the sweet, and deopilate more than *Malaga*. But *Malaga* Raisons inactivate, obtund, and maturate more than *they*, because of their Mucilaginous sweetness, and are therefore better in Catarrhs, Rheumatisms, Small Pox, Stone, and wherever a thin acrid, crude Serum is to be corrected or ripened.

They consist of a manifest, sweet, viscid Principle; and of an acrid volatile, something occult; which from its acidity digesteth and healeth, and from its acridness, detergeth and dryeth.

Of SUGAR.

IN a Pectoral Cough, which arises from Puitious Blood, pouring out gross Feculencies, into the Lungs, a too liberal use of Sugar seems pernicious, because it renders the Mass of Blood more feculent, than it was before, and stuffs up the *Bronchia*, with a fresh income of Filth.; for in the *Island of St. Thomas*, they fat their Hogs with the press'd out Sugar Canes, which makes them so fat and tender, that their Flesh may vie, for goodness, with the *Spanish* Capon; from whence we may infer, that if it hath a Faculty to produce

• such

such tenderness in Hogs, which is the grossest and tenderest of all Flesh; for the same Reason it will promote and hasten Corruption, and a *Sphacelus* in the Lungs, which are of a *soft and spongy substance*. *Fuller.*

Of COFFEE.

IT is useful, where a decoction of the Woods or *Aqua Calcis* are proper; as also in Disorders of the Head, from Fumes and too great Moistures, because of its absorbent quality, as appears by its serviceableness after a debauch; but it dries the Nerves too much, and promotes watching by bracing the Fibres too streight for that relaxation, which is necessary for Sleep. Although in a cold Constitution attended with a Rheum, from the Glands about the Head and Stomach, whereby Sleep has been hindered, it has been known, that Coffee has so absorbed the distilling Rheum, that Sleep thereby has been procured, so that if wisely managed, it may have different effects, in the same Patient, as Dr. Quincy well observes.

Altho' boiling the Water may sepeerae any Foreign Matter from it, if it afterwards stands to settle, yet thereby the highest and best part of the Water is evapored; from whence we may infer, that to boil it *much*, for Coffee and Tea, is certainly the *worst way*.

Phlegmatick Fat People, may drink Coffee very strong, upon an empty Stomach, without Su-

gar, Milk, or Butter, the more to *Irritate*, and *Contract* the *Fibres*. But People of a Lean, Dry, Chollerick Constitution, ought either *wholly* to forbear it, or drink it weak, with Butter, or Sugar, or both; and upon a full Stomach, because in such, it dries the Solids, expends the Serum, gives Tremors of the Hands, Palpitations of the Heart, Asthma's, Vapours, and what not? And all this, by an hot pungent Oil, which it affords in double the Quantity of Wheat, or Beans. For a quantity of Coffee that yields two Ounces and an half, and two Scruples of Oil, the same quantity of Wheat affords but an Ounce and six Drams, and horse Beans, but one Ounce, three Drams, and ten Grains.

Of BOHEE TEA.

BY all Experience it is found to be of a softening, healing, nourishing Quality; and is therefore a good Breakfast, especially with Milk; it very sensibly satisfies Hunger, and affords a fine Balsamick Nourishment, and is therefore, very properly recommended in Ulcerations, especially of the Lungs, this has caused some Empiricks to impose upon the Credulous, a pretended Spirit of Bohea Tea, for a great Restorative, but it is easy to see through such a Cheat; for such Balsamick Qualities which easily draw out, *only* with hot Water, are the most remote from any thing of a Spiritous Nature, and therefore will not rise in a Still under that Denomination. And if we endeavour to reduce them to a Spirit by Fermentation,

tation, (which seems wholly impracticable,) yet by such an Operation they will be so broke, and changed, as *wholly* to loose their Smooth, Adhesive, and Balsamick Qualities, and therefore, in that form, can no way *answer the intention* of a Restorative. *Quincy.*

Of GREEN TEA.

IT is very grateful both to the Smell and Taste, and carries a pleasant Roughness with it, into the Stomach, which gently astringes its Fibres, and gives them such a *tensity*, as is very necessary to a *good* Digestion, and its Roughness may be so far increased as to make the Stomach contract and throw up its Contents; from whence it is evident, that it is proper, in all Cases where one is affected with Rheums and thin moist Humours, and Catarrhs, running of the Nose, and Eyes, &c. It is also useful in weak Stomachs, want of Digestion, weakness of the Joints, and also for the Gout it self; and it is reported by *Schroder* of the Inhabitants of *China* from whence it comes, and who use it much, that they are free from Diseases of the Joints and Reins; and also, that it takes off the ill Effects of hard Drinking, and it will inable one, to continue a long time without Sleep. And where the tenderness of a Constitution will not admit of more nauseous Doses, there is *nothing* more proper for an Emetick, for it gently deterges the Slime from the Membranes of the Stomach, and leaves such a moderate Restriction behind, as prevents all Nauseousness, and that drain

of Juices, which flows in from other Emeticks, and is hard to stop; it is greatly useful against Surfeits, and if it be used after Eating, it helps Digestion and prevents the uneasiness which attends a weakly Stomach. It keeps clean all the *Emunctories*, and is esteem'd by some, as a preventer of the Gout; it operates mostly by Urine, and if it be drank in too great Excess, it may so wear off, the substance of the Solids as to bring on a Consumption; and in some very nice Constitutions, it is apt to vellicate the Bowels, and produce the Collick, but if used with Moderation, it generally occasions a sound State of Health; it is best in a Morning, but not so good at Night, Rest, and the posture of the Body not so well favouring its most usual Discharge and Tendency.

Of WINE.

THE strongest Wines are (generally speaking) most agreeable to our *English* Constitutions; for *these*, by their Spiritousness, conduce very much, to the Digestion of our gross Food, and that (more especially) because we eat much Flesh, and but little of Herbs: And tho' the thinner Wines are more *grateful* to the Stomach, and less trouble the Head, yet they carry a *Tartar* with them, into the Blood, which they leave behind, in the *mucilaginous Glands* of the Joints, occasioning the Gout, &c. Yet *French Clarret*, which is of that light kind, by reason of its gentle Stipticity, and great quantity of Tartar, which it contains (if drank with moderation) prevents its relaxing the

the Stomach, and rarifying the Blood, so much as other Liquors commonly do.

Those that are used to take a Bottle at Night, their Food ought to be nearly Digested, before they drink their Wine; or their Supper ought to be very slight, and of easy Digestion: And *Sollid* rather than *Liquid*, otherwise the Stomach will be apt to be too much relaxed, and good Digestion hindered.

Those who intermix Wine, with their common Drink, are not so subject to Coughs, and other Distempers of the Breast; and Dropsies, yet they are more afflicted with the Gout and Gravel.

White Wine has a Sulphur, fixed by an acid Tartar, and if we mix with it, *Ol. Tartari per deliquium*, it acquires a blackish yellow Colour, because of the Exaltation of its Sulphur, and yet the Urine that is made upon drinking it, looses its red Colour, upon adding *Oleum Tartari* to it; and becomes of a deep Red, when Acids are added to it. Which may serve to demonstrate the great Alteration that Liquors suffer, when mixed with the ferment of the Stomach, Bile, and Blood.

Those troubled with *acid Belchings*, must refrain drinking of Wine, unless Wormwood be infused in it; and those afflicted with *bitter Belchings*, are cured by drinking of it: Because its Tartar corrects, and subjugates the Exalted Sulphur; according to *Martian*.

Of FERMENTATION.

Wine, Ale, and Milk, are only certain quantities, (tho' in different proportions) of Salts, Sulphurs, and Earths, swimming in Water, and the difference between fermented, and unfermented Liquors, is nothing but the different proportions, of the Earthy Particles; and subtilty of the Sulphureous and Saline, swimming in Water: For, from unfermented Liquors, we may by distillation, extract large Quantities of Oil, and the *Caput Mortuum*, will be more, than after Fermentation: But when by Fermentation, the Sulphureous and Saline Particles are volatilized, that which before, was Oil, and *Essential Salt*, arises now by distillation, in the form of Spirits, and *Volatile Salt*, Spirit being nothing but Oil, and Salt, subtilized; its parts being divided by Fermentation, the pungency of the Spirits is wholly owing to the sharp Salts, set at liberty, which before were sheathed, in the viscid parts, of the unfermented Liquor.

Fermentation being only, a violent agitation, in any Liquor, whereby the Cohesive Parts are divided, and those which are too heavy to swim in it, sink to the bottom, and those which are too light to sink are forced upwards.

In the Scurvy, Leprosy, Itch, and in all cases where Salts abound, in the Blood, unfermented Liquors are best, as also in Pleurisies, Rheumatisms, &c. if used with Caution.

Barm or *Yeast*, consists of many subtile, Spiritous Particles, wrapped up in such as are viscid; now when this is mixed with a Liquor, disposed for

for Fermentation, (such as Wort is) it cannot but much contribute to that intestine Motion, which is occasion'd by the intercourse, and occurrences of Particles, of different Gravities, as the Spiritous Parts, will be continually striving to get up at the Surface, and the viscid ones, continually hindering their *ascent*, and retarding their escape, so that by these two concurring Causes, the Particles extracted from the Malt, will by frequent Occursions, be so comminuted, as continually to increase the more Subtile, and Spiritous parts, until all that can be made so, by attrition, are set loose from their former viscid Confinements; and if this intestine *Luctus* be permitted to continue too long, a great deal of Spirit will fly away, and the Remainder grow flat, &c. Now having premised thus much, it naturally falls in our way, to treat.

Of MALT DRINKS.

AL E and Beer, and other fermented Liquors, contain in them a great deal of *Sal Volatile Oleosum*, by which they become agreeable to the Stomach, and cause an Universal Relaxation, thro' the *Animal System*: Impediments to the Bloods free Circulation will hereby be removed; the Diameter of all the Arteries being enlarged, a large Cilinder of Blood will pass, thro' them, without touching their Sides, from whence, the resistance proceeds; the Arteries being *Conical*, and therefore it will move with greater celerity, and consequently increase the quantity of perspi-

rable Matter, and Urine. Now all the Symptoms of Drunkenness may be accounted for, from an universal Relaxation: For in a drunken Fit, a greater quantity of Blood, is thrown into the Brain, and those Parts nearest the Heart, by which in time, the Tone of their Fibres is destroyed, and become unable to carry on, the Circulation of the Humours, and so *Old Tiplers* grow stupid, subject to Palsies, Appoplexies, loss of Memory and Appetite, ill Digestion, Tumors of the *Viscera*, &c. From whence proceed the Jaundice, and Dropsy, the common fate of Sots.

Now since these are the common Effects of Drunkenness, and brought about in the manner here assigned, we may hence learn, what sort of Liquors may be most safely drank in large Quantities; and that is, such as are very clear, and have a dry pungency on the Tongue.

To Men of a dry Constitution, *Ale* is more agreeable than Wine, being more soft, slippery, and smooth, and by Consequence more nourishing, and fitter to relax the Tense Fibres: But in the general, the nearer Malt Drink approaches to Wine, the better it is; wherefore it should be made of clear Water, that will bear Soap, and be well hopp'd, that it may keep till all the viscid gross Parts, are fallen to the Bottom: It should have done fermenting, and be fine, tho' not inclin'd to sourness, yet to sparkle in the Glass, but the smaller the Bubbles are, the better.

Without hopping we must (especially in Summer) either drink our Beer new, Roapy, and half Fermented, or else old and stale: Besides hopp'd Drink, is beneficial even in the Stone, tho' the common Opinion is against it. Hops are a grateful Bitter, and good against Stone and Gout, according to Syddenham (*Opera Univers a.p.*

418, 419, and 526.) But they, and all Bitters, are unproper for Persons of Chollerick and hot Constitutions. Thus far from the Authority of Dr. *Wainwright*, our next Author shall be Dr. *Fuller*, whose Words are to this effect.

Whatever some Outlandish Men may invidiously say, and others as slavishly believe, *midling Ale* brewed of the best Malt, boiled, fermented, depurated, according to Art, that hath no burnt *Must*, nor otherwise *ill smack*, that is pale, sparkling, fine, fresh, and not upon the fret, and also is of Age just to leave its Malty Taste, grow *Winey*, and yet not run into any degree of sourness, such Liquor is the most comfortable, and coveted Drink, the World perhaps ever found out, to pacify the loudest of Natures cries, under the Tortures of a burning, hot, and thirsty Stomach.

For beyond all other things, it cools and moistens the parched Membranes of the Stomach, scoureth salt, acrid, bitter, frothy, slimy Filth, from off the *Villæ* and Glands; turns it over the *Pylorus*, and leaves a balmy benign *Litus* instead, to keep all supple and easy: Thus it quencheth that most unsufferable Passion of Thirst, refresheth the Bowels, and proves a true Cordial, in Outragious scalding Feavers.

After these good Offices, in the Ventricle, it detergeth, openeth the Mouths of the *Lacteals*, that were almost baked up with slime; dilutes and refrigerates the Blood, allays the fervent Heat, and *Crispations* of the parboil'd *Fibrillæ*, repairs all the waists with nutritious *Chime*, cleanseth the minutest Passages, and Emunctories, and helpeth the whole Mass to circulate freely, and duly, to nourish and cherish the Parts, and to throw off its Recrements

crements by Urine, and (where there is an aptitude) by Sweat, and Spittle.

The sweeter, thicker, and softer Ale is, the more it suppleth, filleth, and nourisheth; the smarter and staler, the more it openeth, and detergeth: And Hops (which give it the name of Beer) are for that intention, such an Ingredient (not bad for the Stone) and so particular, that nature seems to have put them into the World, for this very use, without a Fellow: For when the covetous Brewers, have in dear times, used all their Indeavours to find out a *Succedaneum* to them, never could they light upon any thing, that would Clarifie, relish and preserve Beer, as Hops do.

Yet in Rawness, Windiness, Weakness, and Sourness, of the Stomach and Intestines, occasioning Belching, Vomiting, Looseness, and Collick; also in Pleurisies, Catarrhs, vagous Pains, Dropsies and such like Affects, as arise from great *irritability* of the Fibres, and Nerves, and Colliquation of the Blood, and Humours, in these Cases, (and perhaps, some more) the best Ale, by Reason of its Coolness, Detergency, Smart, Pricking, Cutting, and Springy Particles, is not advisable; but Vapid, Thick, Heavy, Fretting, Hard, Sour, Stale, Old, Strong, &c. are *manifestly* *Mischievous*.

Old Beer stimulates the Fibres of the Guts, and Stomach, hinders and allays the genuine Ferment of the Stomach, precipitates the Digestion, and frets off too much of the *Mucus*, that adheres to the inward *Coats* of the Guts, and so causes Fluxes, Gripes, Convulsions, &c.

And now for a Conclusion to this Head, let us hear what the Ingenious Dr. *Quincey's* Opinion is, relating to this Matter: Hops (says he) are a grateful Bitter, and add Particles to the Beer, with

with which they are Mixed, Subtile, Active, and Rigid, and by that Means, the viscid *Ramous* Parts of the Malt, are more divided, and render'd more easy of Digestion, and Secretion in the Body, and prevents the Liquor from running into Cohesions, such as would make it Roapy and Sour. Hops are accounted Discutient, Aperitive, and Proper in all Obstructions of the *Viscera*, and in particular of the Liver, and Kidnies: Therefore the ill Name they have gotten, with some, of breeding the Stone, in the Bladder; is without any Reason.

As to that Question, whether Ale is more diuretick than Beer? In some Constitutions it may, because Ale is more Smooth, Softening, and Relaxing; and therefore, where Urine is to be promoted, by enlarging the Passage, *Ale* is most likely to do it, and this is commonly the Case of thin, dry, Constitutions: But where Urine is to be promoted, by attenuating and breaking the Juices, and rendering them more fluid, it is best performed by Hop'd Liquors. ¶

The stronger Malt Liquors are; the more Viscid Parts they carry into the Blood; so that the ill Effects of a Debauch with Wine, sooner wears off, than those from Malt Liquors, whose viscid Remains are long e're they can be shook off. Therefore the best Malt Drink is that which is of such a Strength, as to carry some small Warmth into the Stomach; but not so strong as to prove an unfit Diluter of our Food; not but stronger may be allowed to robust Constitutions, who labour hard, and whose Food is poor and slender; which deficiency, strong Beer supplies, and their continual Labour and Strength digests; and breaks the Viscidities of the Drink, and converts it to Nourishment.

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The Pale Malt, has most of the Vertue of the Grain in it, and is therefore most nourishing; but requires a stronger Constitution to Digest it; or else the Old Age of its Drinkers, is commonly full of Diseases, more than that of others.

The Brown Malt makes a drink less Viscid, and more fit for Secretion, but the Excess of it, will be attended with the same inconveniencies as the former, tho' a single Debauch of *this*, wears much easier and sooner off than the other.

Beer Brewed with Pale Malt, and Spring, or Well Water; and not made too strong, is certainly the best; *because* the Mineral Particles of the Water, will help to prevent the Cohesions, of *those* drawn from the Grain, and fit the Liquor for Secretion: But Rain, and River Waters are reckoned best to draw out the Substance, of high dry'd Malts; *because* the fiery Particles they contain are best lost in a soft Vehicle.

Those Liquors of this sort, that are longest kept, are least viscid, and by consequence fittest for Secretion; but this is to be determined, by their Strength, because they arrive at their Perfection or Decay, sooner or later, according to their Strength: And when Beer is kept till its Particles are broke, as far as they are capable, then it is, that they are always best; so far we have the Sense of Dr. *Quincey*: Now let us come to some Physical Observations of Ale; and first, Scurvy Grass, and such like Vegetables, whose Physical Force, lies in a very Fugitive Salt, ought not to be put into Ale, till the Fermentation is past; and then it must be immediately stopped up close.

Lemorte informs us, that purging Ales kept till Sour, loose almost all their Purging Property.

In Diet Ale's, where Guaicum, Sassafras, &c. are prescribed, it is the best way to boil them in the Wort first; then strain out, and put them into the Bag with the other Ingredients; to get out the rest of their Vertue by Fermentation; or leave them wholly out in the Fermentation that there may be the more room, for the other Ingredients.

In Diet Ale, where Millepedes are ordered, or Antimony, it must by no means be kept till it is Stale, or *Eager*, for then its Acidity will destroy the Volatile Salt, of the *Millepedes*, and so much unlock the Antimony, as to incline it to turn Emetick.

Much good cannot be expected from the Use of medicated Ales, except they be continued for some considerable time, as Thirty Days at least. And it will be necessary about once a Week, to take some proper Cathartick; and before you begin, if the Body be foul to take an Emetick, to clear away the Slime and Filth from the Stomach; and to begin with a lesser Dose of the Ale, and so increase daily, till you see what dose fits best the Constitution of the Patient.

Where Filings of Tin are used, as an Ingredient, it is best to put them in a Bag by themselves, and then to put that Bag into the Bag of Ingredients; for so the Tin will serve again as often as you have occasion, as will Antimony also if so ordered.

To Chalibeat Ale.

Take Filings of Steel, one Pound, White Tartar Four Ounces, beat them together in a Mortar (not Brass) pouring on by little and little, Juice of Lemons, enough to bring it to a *Mash*. And when it has remain'd so twelve Hours, tie it up
in.

in a Rag and put it (with the other Ingredients proper for the Case in Hand,) into four Gallons of fermenting Ale, and let all Ferment together, till the Fermentation is over.

But before you use the Filings of Steel, for this Purpose, you will do well to digest them, in a small quantity of Ale, for a Month before hand, and then put in that Ale, and the Filings with the Mash, with the Bag they are in, into the Cask of Ale, and add to it three or four Civil Oranges cut in Pieces, and if you use Scurvy Grass, be sure you let it be Green, for the drying of it looses many of its volatile, and best Parts (except such as is before excepted) the best way to fetch out the Vertues of most Ingredients, is to work the Ale with them in it; for that now being run into a notable Pungency, and Smartness, penetrates into their inmost Substance, and soakes it, and makes it soft; and then the gentle and intestine Motion of Fermentation, knocking asunder their *Vincula* or Mixture, they naturally fall to Pieces, and separate into Parts, and those Parts are readily taken up, into the Body of the Circumambient *Menstruum* and fill it, according to its Congruity and Capacity.

Of WATER.

THE Purity of Water is best found by its Transparency, *Fluxility*, Insipidness, and the less it is mixed with Vegetable, Mineral, or Terrene Particles; but there is none but what has some; and from hence it is, that it Decays and
Stinks

Stinks upon its Stagnation; for it being filled with Particles of different Gravities, some will subside, whilst others emerge, and so divide themselves, as some of them will become lighter than the Air, and strike the Nose with an unpleasant Odour, which when spent, and the rest subsided, the Water again becomes sweet.

Rain Water the soonest stinks, because the freest from Mineral Particles, yet is well loaded with Vegetable Ones, and if it was not for this, it would be the wholesomest to drink; of any other; but Spring Water being less apt to Corrupt than Rain Water, altho' heavier, (provided it run with a strong Current, and will bear Soap,) is fitter for common Use.

Of whatever Nature the Gross Particles, with which the Water is saturated, is; these, according to their several Gravities, the Capacity of the Canals, and such like Circumstances, will, when they come to circulate in the Animal Body, be by the Laws of Motion, deposited in one Part or other; and because impure stagnating Well-Water, has a greater aptness to extract the Tincture out of Malts, than smooth River-Water has; because such Well-Water abounds with Mineral Particles, and *Alluminous* Salts; therefore many ignorant People choose it for brewing of Beer, which is certainly a great Error: For Clay being a *Mineral Glebe*, the Metallick Salts, and Gross Particles with which Waters passing through such a Bottom do abound, are indigestible in an Human Body, by which are produced Concretions in the Kidnies, and Bladder, and Joynts, Scurvies, hard Swellings in the Spleen, and by their Corrosive Quality twitch, and irritate the Membranes of the Stomach, and Bowels, and hinder Digestion, and when it comes into the Blood it obstructs the small
Canals

Canals of *Insensible* Transpiration, and so causes *Cachexies*, Pains in the Limbs, livid Spots in the Skin, Ulcers, &c. especially in weak Constitutions, and those of a sedentary Life.

And *Pliny* tells us, that those Waters are condemned in the first Place, which when boiled, do *incrassate* the sides of the Vessels; and that our Well-Waters do this, no Body who looks into the Tea Kettles of our Gentlewomen, can be ignorant. *Mead.*

If we design to *Relax* by drinking Water, we should take it warm with the Infusion of *Sassa*, *China*, *Liquorish*, *Althea*, or the like. Or if we would lessen its relaxing Quality, we may mix it with Green Tea, Coffee, or Bitters; for as all Bitters contract the Fibres of the Stomach, they are called *Stomatricks*.

Now as those who are of a lax Constitution cannot bear much Water-drinking, so those of a *Robust* Habit cannot bear Bitters; whence it is, that Coffee, Tea, and Bitters, are so useful to some, and pernicious to others.

Sanctorious informs us, *Aphor.* 67. §. 3. that drinking of Water hinders *Insensible*, and helps *Sensible* Perspiration; now since an increased Perspiration, is the Effect of an increased celerity of the Motion of the Blood, or an Inlargement of the Pores, so a diminished Perspiration must be the Effect of a slower Motion in the Blood, or of straiter Pores; from whence we may learn, that drinking of Water is proper in Feavers, and all chronical Diseases, attended with an *Effervescence* of the Humours; as Gout, Headach, Melancholly and Billious Hemorrhages, &c.

Nothing is less *flatulent* than Water; no Liquor we drink having less Air contained in its Pores; as all fermented Liquors and made Wines have; which being heated in the Stomach, the Air contained

tained in them unfolds its *Springyness*, and forces its Way upwards in *Ructus's* or *Belchings*; they also convey great Quantities of Air into the Blood, which so *thins* and pounds it, as to produce all those Disorders which Water is so proper to prevent.

Yet if taken in too great Quantity, it too much relaxes, and spoils both Appetite and Digestion; and Mineral Waters would do the same, were it not for their *stiptick* Quality, and their Salts carry them into the Habit of the Body; and inables them to open Obstructions, which they would not do, were they divested of their Mineral Qualities.

All *Spring Waters* as they travel through the Earth, *wash off* and carry with them, some Particles of the Soil they pass through; so that they become Wholesome, or Mischievous according to the Nature of the *Mineral Matter* which they are associated with, in their Journey; so that those are certainly the best to Drink, which are the clearest, from any mineral Particles, and the *lightest*; and it may be determined which are so, by weighing other convenient Bodies in them, which we are taught by the common *Hydrostatick Scales*, and the way *by Soap*, is also very instructive, for the more ready they are to *Lather*, the more fit they are for Drinking: Those Springs which arise out of *Chalk* are accounted the best, *because* in Chalk we find no unwholesome Mineral; and they are apt to absorb any poysonous Particles from the Water, as it passes thro' its Bowels.

Those *Spring Waters* that are impregnated with *Aluminous* or *Nitrous* Particles, (being abstersive and restraining) if drank in a Morning, help those Stomachs that are relaxed by intemperance, by washing off their *Filth*, and *Slime*, and by astringing their *Fibres*, and drawing up the Membranes

to a due *Tensity*: Those of the Alluminous kind not far from *London*, are to be found at *Epsom*, *Dulwich*, *Acton*, and *North Hall*, &c.

River Water, partakes of the Soils it runs thro', tho' less than that of Springs; and may be accounted as a compound of Spring, and Rain Waters together, and as Spring Waters in their Subterraneous Travels, take up many Mineral Particles, so River Waters take up much filth from their Ouzy Bottoms; and in their long Passages, both the Mineral Particles that are communicated to them from the Springs, and the Ouzy Ones, that they gather'd up in their Journey, will by Degrees fall and sink, or be so intangled in more wholesome Clay, and Ouze, that they will *in time* be almost quite lost.

Rain Water comes nearest to an *Homogeneous Fluid*, and is therefore to be preferr'd as a diluter, before any other sort.

Well Water is subject to the same inconveniencies as Spring Water, and which is a greater Mischief by its Stagnation, it may take up from the Bed it lies upon, such Particles (betides what it brought thither) as will render it more unwholsome: Therefore, of all Waters that from a Well, especially if it be a deep one, is the most to be suspected.

Pond Water as it is mostly of Rain Water, so it cannot be distinguish'd from it, if it comes from a *clean Bottom*. But then, what by the Motion of the Wind, or the Treading of Cattle, or some other Cause, it is generally so disturbed as to force up its filth, which Corrupts and Ferments and makes it the most *uncleanly* (at least) of all the rest.

Snow Water brings so much Nitre with it, as renders it both deterfive and diuretick, but is not used internally unless upon necessity.

Of Distill'd Waters.

IN making *those*, if before Distillation, you boil the Water, the Crude Particles will so evaporate that it will not grow either Mothy, or Musty, or at least not so soon. But a more easy way is, to throw into the Still about a Pint of Spirits, for every Gallon you design to draw off.

Quincy says, that all those Ingredients which in Distillation raise nothing but *Phlegm*, as may be discern'd both by the Scent and Taste, of what is Distill'd, as Cardus, Fumitory, Cowslips, Lilly of the Valley, &c. are no better than Water from the Pump, nor does any Balsamick, Emetick, or Cathartick property, of any Medicine come over in Distillation; but those properties are left in the *Residuum*, in the Still, to be come at, by extract or otherwise, thus the *Syr. Rosar. Solutiv.* is as well made, after the Damask Rose Water is drawn off, as from the fresh Flowers put into infusion, and the *Syrupus Erosis Siccis*, may for the same reason be made of the *Residuum*, after the Water is drawn off; and so of many others; so extract of Gentian, &c. is conveniently enough made, with what is left after Distillation.

But before we run away with this Notion, I shall here produce Dr. Fuller's Opinion to the contrary, viz. "How many ingenious Hot Heads (says he) have we seen, whose Brains were fill'd with nothing but Fumes, Fancies, and Falcities, that might as well have been furnished with useful practical Knowledge had they been content, to have let Experience go be-

fore, and Reason follow after : Upon *these* Considerations, tho' *Zwelfer* denies any Vertues to Snail Waters, because Snails and Bread cannot send their Mucilage and thick Juice, over the Helm, in Distillation ; yet, for ought he knew, (and 'tis believed Experience vouches it) *Sanative Effluvioms*, which tho' our Senses cannot reach, yet may be sufficient to enrich their *Watery Vehicle*, with Medicinal Vertues.

And that distill'd Water is not the same with Spring Water, is hence evident, that if you drop a Solution of *Sacc. Saturni*, made in common Water, or of Silver made in *Aqua Fortis*, into Spring Water, it will turn it Milky White ; which it will not do, if dropp'd into the same Water distill'd.

That Water distill'd from Milk, is not pure Elementary Water, appears (amongst other Arguments) from hence, if it be too long kept, it becomes sour ; now *Flesh Broth* (which is Water impregnated with Animal Juices) will do the same ; but as for *Simple Water*, tho' it be kept an whole Age, it never will. But Milk Water is a fine Animal Dew, agreeable to our Natures, which supplies a soft amicable *Limpha*, void of all *Asperities*, dilutes Edulcorates, and mingles the whole Mass of Blood, renders it uniformly Liquid, and *Homogeneous*, and helps it to circulate freely, subdues its Fervor, and nourishes the Parts, but it ought to be had, *under the Cow*, milk'd into a *Cucurbite*, and that immediately closed, and distill'd off, with a very low Degree of Fire, and to draw no more at a time than the Patient drinks at once, &c. *ibid.*

Those Plants whose volatile Parts are so loose in their Combinations, that they fly off in drying, as Baum, Lillies of the Valley, and all of a tender
Scent,

Scent, ought to be distill'd as soon as gather'd, but those who preserve their volatillity, as Marjoram, Rosemary, and the stronger Aromaticks are best to distil when dry, if not kept *too* long, and if in distilling, you throw in a handful of Potashes, they will both load and keep down the grosser Phlegm, and seperate and vollarilize the finer Part.

The Spirits of Herbs made by *Fermentation*, cannot be depended upon, so as to have much of the Vertue of the Plant in them, for in Fermentation (even) of Odoriferous Plants, the Spirit flies away, in the intestine Motion of Fermentation, and leaves them no more Vertue than those of a non-Odoriferous Nature, which raise nothing from the Still, but Phlegm, and a very little nitrous Salt, which is strained into them in the nourishment from the Earth.

Of Medicinal Waters.

Those that abound with an Alluminous and Nitrous Salt, are those of *Epsom*, *Dulwich*, *Acton*, and *North Hall*; these do great service where the *Primæ Viæ* wants cleansing, if not too often repeated, otherwise their Salts will too much get into the Blood, and so in time, by their grossness, obstruct the Glands, and occasion Feavers of an ill kind: Those that please to make a Whey of them, may boil them up with Milk, a Quart of Water to half a Pint of Milk, is the Rule; these Waters are of great use, in those Collicks, where the peristaltick Motion of the Guts is inverted;

but the Patient must walk about, or be kept *erect*, for the moisture, softening, and relaxing the Fibres, and the Weight pressing downwards at the same time, are of use to force their Passage quite through, in which consists the Cure.

Those called *Epsom Salts*, and sold for such, are all a cheat, and common Salt dissolved in the same quantity of Liquor, would Work as well.

These Waters are all best at the Well Head, and much of a strength; if any can be said to be strongest, it is that of *Dulwich*.

Those that partake of Iron or Steel, are those of *Tunbridge*, *Scarborough*, *Hampstead*, and *Islington*. There is hardly any alterative of greater efficacy, than those from *Iron*, and therefore ought to be used with Caution; for if they are taken in too great plenty, and in sanguine Habits, they will raise the Blood too high, disturb the Nervous Fluid, and put the whole Man into disorder, causing Vertigoes, Epilepsies, Apoplexies, and the like.

In Young Persons, due Evacuations ought to be made whilst they drink these Waters, especially if they make the Patient Costive.

In the Green Sickness, in all Obstructions of the *Viscera*, especially of the *Uterus* and Kidnies, in a relaxed tone of the Stomach and in *Crapula's*, they do great service; and in such as by long Illness, or from any other Cause, have their Blood poor, thin, cold, and watery, these Waters give great assistance.

Of Hot Baths.

THE chief of this kind that we have, is at *Wells*, in *Somersetshire*, it abounds with a Mineral Sulphur, as appears by its turning Silver, or Copper blackish; the Bath Mud rubb'd upon Silver, makes it of a Gold Colour; and some that have boil'd it in Oil, say that it makes a good Balsam of Sulphur.

The Distempers it helps, are *Languors*, Debilities, Waits of the Constitution, old Pains, and Aches, that are the remains of Nervous Distempers, and where some particular part continues contracted; or has any Humours fixed upon it, which it cannot dislodge, these Waters pump'd upon it hot from the Spring, do very great service; also in Gouts, Rheumatisms, contracted and paralytick Limbs, Aches, and Lameness, &c.

Likewise inwardly used, they strengthen a decay'd Stomach when worn out by Debauches, and help *Nauseas* and Vomitings, and in Abscesses and Ulcers of the Kidnies, or Urinary Passages, they do very great service, as is evident by daily Experience.

A general Bathing in these Springs, effectually opens the vast number of Secretory Orrifices, upon the Surface of the Skin, and clears the Cutaneous Ducts of all offending Matter; so that all the Fluids have more room to flow in, and liberty to Reek out, what is not of service to the Human Body in a very pleasing Manner, without Pain or Trouble.

In *warm* bathing, the Pores being open, the Water insinuates it self, into the Body, and mixing with the Blood dilutes it, and dissolves the acrid Salts in its *Serum*; we may see a Demonstration of this, in observing how deal Boards will swell against rainy Weather, the Air pressing upon the Aqueous Particles, floating in it, forces them into the slender Tubes of the Boards, where they meet with no resistance, the Particles of the Air being too large to enter the same; from whence it appears, that the Component Particles of Water, are less than those of Air, which will be farther cleared by fastening a piece of Whipcord, of a Yard or two long, to a Hook, and at the Bottom of the Cord, fix a Weight, tho' never so great (if not so great as to break it) and you will find, that the Weight will rise in *moist*, and sink again in *dry Weather*, and the same it will do by moistening the Cord at any time, by which, a very little Water will vanquish any *finite* resistance, if the Cord will bear it.

And tho' the quantity of perspirable Matter, is * five eighths of the Meat and Drink a Man takes in a Day, yet if we compute the quantity that perspires from any part of the Skin, in a given time, we shall find it too little by far, to hinder the entrance of Water into the Body, when we enter into a Bath.

(a) The Matter of insensible Perspiration in a Minute, is the 1200 part of the place it comes from, viz. a Scruple of the Skin perspires $\frac{1}{1200}$ Ɔ

* *Sanctor. Med. stat. apbor. 6. § 1.*
Sertationes Medicae, p. 130.

(a) *Dr. Pitcairns Dis-*

in a Minute; and so consequently $\frac{3}{4}$ of the Skin perspires one twelve Hundred $\frac{3}{4}$ in a Minute: Now suppose a square Inch of the Skin weighs a Dram, then a square Inch perspires $\frac{1}{1200}$ Drams in a Minute, but a square Inch of the Skin is press'd upon by a weight, when we bathe (more than in the open Air) equal to $\frac{3}{4}$ xcvi, for we may conclude that our Bodies, one part with another, are two Foot under Water when we bathe; so that every square Inch of our Skin, must bear the weight of twenty four Cubical Inches of Water equal to $\frac{3}{4}$ xcvi. For a Cubical Inch of Water being $\frac{3}{4}$ iv. is $\frac{184}{1728}$ throwing away the Fraction, twenty four Cubical Inches must be one Thousand seven Hundred and twenty eight $\frac{3}{4}$ xcvi. Now since only $\frac{1}{1200}$ $\frac{3}{4}$ of Matter, is perspired thro' a square Inch of the Skin in a Minute, therefore is the elevation of the perspirable Matter, resisted by a weight a Hundred and fifteen Thousand two Hundred times greater than it self. How great then must be the celerity with which the perspirable Matter moves, if we imagine it able to raise a Body one Hundred and fifteen Thousand two Hundred times heavier than it self; and thus would it be, if the whole quantity of perspirable Matter evacuated in a Minute, was to exert its force at once, upon the incumbent weight of Water, but it is so far from *that*, that if the exhalation of the Steams, be not continual as the pressure of the Water is, yet the intervals betwixt the times, they are *propell'd* from the Body are very short; suppose Sixty of them in a Minute, (being about the number of Pulses that a healthy Man's Artery beats in that time) then will the quantity of Vapours which exerts its Force at once, against the incumbent Water, be lx times less than what I at first assign'd, which being multiply'd

tiply'd by twelve Hundred is equal to Seventy two Thousand, the number of parts into which a Dram of perspirable Matter is divided, one part only of which exerts its Force against Ninety six Drams of Water in a *Second*, so that the perspirable Matter that rises every Second, must raise a weight six Million nine Hundred and twelve Thousand times greater than it self, if it resists the entrance of the incumbent Water; for Ninety, the number of Drams of Water, incumbent upon an Inch square of the Skin, multiply'd by Seventy two Thousand, the number of Parts into which a Dram of perspirable matter is divided is equal to six Millions nine Hundred and twelve Thousand, the difference between the quantity of Matter perspired in a Second, and the quantity of Water, by which its Motion is resisted.

By all which it appears that the Bath Waters will mix themselves with the Humors of the Body: So that there is nothing so wonderful in bathing, but what may be accounted for, from some of the above mentioned properties of Water, even without having recourse to the Salts, with which Bath Waters are impregnated, which notwithstanding may contribute their share in the Cure of some Distempers. Wainwright.

Sanctorius tells us, that a Flux is cured by promoting perspiration in warm bathing, *Aphor. 92.* and Hypocondraicks relieved by frequent bathing, *Aphor. 102.*

Warm bathing helps Perspiration, and refrigerates the internal Bowels, and gives ease in Nephritick Pains, sooner than any thing.

Of Cold Baths.

Their Effects.

THere is hardly any Chronick Distemper, (unless the Body be very corpulent, or the *Viscera* unsound) but the use of the Cold Bath will be advantageous to: But in very Fat corpulent Persons, the Fibres are so stuffed; that they have not room to vibrate or contract, with the sudden squeeze of the Bath, and so will only be weakened in their Springs *to no purpose*; and in unsound *Viscera*, or where any part is weaker than the rest, such a sudden contraction, and additional Force, as the Bath gives to the Sollids, will press the Fluids on such part *too much*; and indanger the rupture of the Vessels, and promote the Discharge of Humours, upon that part, which otherwise might drain off, another way.

But if nothing of this lies in the way, whatsoever is to be effected by bracing the Sollids, invigorating the Vibrations, and accelerating the Blood's Motion, is with *certainty* to be had from the Cold Bath. All Diseases from sizy Blood, and *Alentor* upon the Animal Juices, if the *elasticity* of the Vessels is not wore out, will find relief from the Cold Bath, as Rheumatisms, Hypochondrick Affections, and debility from too tender, indulgent, and inactive Ways of Life; likewise from Bad Transpiration, &c. for from *immersion*, the whole Nervous System is so shook, that the very *Capillaries* feel the Influence of it, and
are

are forced open, by an increased velocity, of the circulating Fluids. *Quincy.*

The Cold Bath is a specifick in the Rickets, and Hemorrhages, whether of the Intestines, Nose or *Uterus*, which are not only cured by it, but their return prevented.

Bathing acts the part of a Diuretick, and plunging over head does more in the Cure of the bite of a Mad Dog, and of Melancholy Madness, than almost any thing whatever; and nothing more effectual in the cure of *Impotency*, when owing to a former Excess of Venery, than the Cold Bath; also in a Fluor Abus, in the too great abundance of the *Cataminea*, weakness of the Limbs, *Sciatica*, Vagous Pains, Wind, Convulsions, Rickets, in all infamatory Pains, that depend upon the sizyness of the Blood, such as Rheumatisms, Pains of the Ears, Eyes, Limbs, Teeth, and Head; and all Pains depending on Salt, or Corrosive Humours, such as Stone, and Strangury, all *bilious* Distempers that depend on an over Rarefaction, of the Blood, and Animal Spirits, nervous Pains, Windy Constitutions, and all Diseases depending on the Saltness of the Blood, also in Stranguries, and nephritick Pains, and it prevents the Gout.

It condenses the Skin, and makes it insensible of Cold; and in the *healthy* it increases the Appetite, quenches Thirst, strengthens Digestion, makes the Limbs strong and lively, and more fit for exercise, and preserves the *Crafsis* and Motion of the Fluids.

But to prevent *Gout*, *Asthma*, and all Chronick Diseases, there must be due Evacuations, both by Bleeding, Purging, or Vomiting, not only *before*, but *in* the use of the Cold Bath, (as the wise Physician sees necessary) or else the Disease will return, upon any new effervescence of Humours.

And

And here we are also to consider, in what cases it is *injurious*, and they are, in Fits of the Gout, in thin, or Consumptive Habits, in cold Constitutions, and old Persons; for those that live intemperately and use no Exercise, in Plethories, Cholicks, Phthisicks, Surfeits, Vomitings, Gripes, Looseness, Inflammations of the Lungs, *Iliack Passion*, and during any Defluations, and if tarried in too long at a time, produce Cramps, Feavers, and Deafness, which *last*, may be prevented by stopping the Ears with Wool, &c.

The time for their use, is from *June* to *September*, but we must not go in to them, when we are *hot*, nor go in *too often*, nor tarry in, above one, two, or three Minutes at a time.

Cautions before bathing.

1. Bleed and Purge, and use a proper *Regimen*.
2. Do not Bathe, if you are hot, above the common standard; and at the first Immersion, go out immediately, as soon as it is performed.
3. Use it fasting, or a while before Dinner, or about four in the Afternoon.
4. Bathe at least nine or ten times, by two or three times a Week.
5. If it be for the Rickets, Palsies, and several nervous Distempers with Obstructions, the Patient ought to *Sweat* with cold Bathing.

But if it is used for preservation of Health, or for invigorating the Animal Spirits, or in Windiness, or Sizeness of the Humours, *Sweating* is not necessary.

6. Plunge in all over your Body *at once*, or you run the risk of a Head-ach, because there being the least Resistance to the circulating Blood in the Head, which is (in this case) pressed upon, *only*
by

by the weight of the Air, it will run so plentifully *thither*, as to distend the Vessels, beyond their usual tone, and thereby cause a painful Sensation.

If we consider the Nature of *Perspiration*, we must believe, the *Morning* to be the most proper time for *Cold Bathing*, for *then*, the Perspiration of the Body is finished, and the Body emptied of all hot Particles, produced by the Fermentation of the *Chile*; and effervescence of the Blood, and *then* (if ever) the Head is serene, and clear, and the Spirits have room to shoot, retire, and *Contentrate*; which upon going out of the Bath, the pressure and coldness being taken off, by their Elastick Power, they force their Way, thro' the obstructed Nerves; but long tarrying in, weakens their force and the benefit of the immersion is lost.

Where the offending matter has been made too fluid, either by the warm Bath, or by Medicines, in Chronical Rheumatisms, Sciatica's, &c. the violent contracting Power of the Cold Bath, will sometimes perfect the Cure.

The most obvious consequence of Bathing, is by a greater pressure upon our Bodies, to straiten the Vessels, and so to dissolve the Humours, and make 'em fitter to pass the Glands, and to squeeze out any viscid Matter, adhering to the sides of the Vessels, and rendering the Matter of the Fluids more free; it also generates greater Quantities of Spirits; and causeth them to move more swiftly thro' the Nerves.

When the *Mercury* stands highest in the *Barometer*, our Bodies are pressed upon, by a weight of Air, (according to Dr. Wainwright) equal to Thirty nine Thousand nine Hundred Pounds Troy, now when this Weight is either increased, or diminished, (as 'tis often by the change of Weather)

ther) it must certainly make a great Alteration in our *Fluids*; but this Pressure is never so great, as when we *Bathe* our selves, *because* Water being above eight hundred times heavier than Air, must needs greatly increase the Pressure, and occasion many Inconveniencies; for the tender *Fibrillæ* of the Skin, being of unequal Strength and *Tensity*, upon this extraordinary pressure, some weak part must suffer.

And that *insensible Transpiration*, is double to all the *sensible* ones put together. *Sanctor. de Med. Stat. Aphor. 59. §. 1. affirms*, and that it is ten times greater, than that by Stool only; so that a Person will be as weak, by perspiring double the quantity, be used to do, as in having ten Stools, where he used to have but one; and if we consider that the greatest part of our Stools, is the Remains of our Food, which could not enter the *Lacteals*, we shall find the difference yet greater; for we can't believe that above one tenth of our Stools is evacuated from the Mass of Blood, by the Liver, Pancreas, and intestinal Glands; so that upon this account, there is as much derived from the Blood in *one day* by Perspiration, as by Stool in an hundred; *therefore*, if Perspiration be doubled, in twenty four Hours, it will make a Man as faint, as if he had in that time a hundred Stools more than usual.

Men of a robust Constitution, and that live plentifully, and use but little Exercise, or not enough to throw off the Dregs of a very full Diet, and who are subject to *Catarrhs*, Pains in the Joints, &c. may receive Benefit by wearing of Flannel; tho' too long a use of it, may so relax the Tone of the Fibres of the Skin, as to hinder that Perspiration which before it helped; *but*, when it is left off, it ought to be in a warm Season, and at the same time, either go into a Cold Bath, or use a Flesh Brush.

The

The effect of wearing Flannel is, that it makes a free and plentiful Perspiration; and whatever other Effects it may have, they are but the *Consequences of this*.

As the Consequence of one Evacuation is the lessening of another, *therefore*, when too much is thrown off, either by Stool or Urine, or Spittle, the wearing of Flannel may be of use.

Usus Veneris makes the Body Costive, as promoting Perspiration, by relaxing the Fibres; which is ever proportionate to the *intenseness* of the Pleasure, and for the same Reason it is, that weak Persons in Winter, are subject to *Diarrhea's*, when the cold Air closes their Pores, and hinders Perspiration, and throws the perspirable Matter upon the Glands.

In many Cases the *Cold Baths* have the greatest Effects, after the use of the *Hot*. Because, where there is a cold clammy, phlegmatick, tenacious Humour, the Cold Bath only stiffens and makes it worse, but when relaxed and loosened by the heat of a Hot Bath, those viscous Humours are melted down, and washed away by Sweat, and then the Cold Bath is very seasonable to corroborate and confirm the Muscles, to brace the Nerves and relaxed Membranes; and *sometimes* neither *Hot*, nor *Cold* will do any Good *singly*, yet in *Conjunction*, will do great Cures; and at other times, the *Hot alone*, or *Cold alone* are most proper; and the *Hot* more particularly in the *West India Gripes* and Cholicks, where a *Paralysis* has been general, with a total loss of Limbs, or the Members of the Body much contracted; the *Hot Baths* have cured both the *Solutions* and *Contractions*, which are such *contrary Operations*, that the most ingenious Dr. *Baynard* says, it is past his Philosophy to find out how such Cures are wrought, unless it be by comforting the

Archeus with mild and gentle Warmth; the Bath being a friendly Fomentation, a natural *Sal Volatile Oleosum*, and a Cordial to the languid Spirits, that puts them in a Capacity to act with more *Vigour*.

But they are mischievous in *Plethorick* Habits; sanguine Constitutions, full Stomachs, or with Medicinal Preparations: Or to such as over heat their Blood by tarrying in them too long at a time, or by exercising their Bodies over much, whilst in them by Swimming, &c.

The chief Ingredients that impregnate the Bath Waters, are Sulphur, Iron, and Nitre, mix'd with *Sal sui generis*, in a small quantity; the Sulphur bearing more than a double proportion to all the rest.

Instead of Wine at Meals, to be used by Bath Water drinkers, a well Brewed middling Beer, made bitter with Hops, Sage, and white Horehound, is far more preferable, as agreeing better with the Stomach, and will cause the Waters to pass better also.

Of Leeches.

Their Use and Danger.

They are look'd upon as proper to draw the Humour from some particular part, and especially if much pained, in grievous Head-achs, and Defluxions from the Eyes, and they do sometimes good service, apply'd to the Forehead,

C c

Temples,

Temples, or behind the Ears, and to the Gums in the Tooth-ach, &c. but in some Habits, and peculiar disposition of the Humours, they occasion such derivation to the part suck'd, as to raise great Tumors, and sometimes an *Erysipelas*, and they are said to be at sometimes, and in some places, really venomous, of which sort are those taken out of putrid standing Waters, Ditches, and stinking Ponds, &c. as also the Black, and Hairy kind, are to be rejected, but those are the best which are taken from clear Waters, and that have Greenish Backs, and Reddish Bellies. From the rash Application of them to the *Hemorrhoidal* Veins, many accidents have occur'd, from the Fluxion thereby increased, viz. *Fistula's*, *Condyloma's*, *Thimi*, *Cristæ*, *Rhagades*, &c. therefore great care is to be used, both in their choice, and application, and not to apply them to parts subject to influx, nor where an Humour is already fallen, lest more should still be invited.

To invite them to seize the part, rub it with Milk and Sugar, and when you would have them fall off, strow Salt or Bitters about their Snouts, and they will gently do it, and if you would have them suck long, cut their Tails off, after they are fixed in sucking, and they will suck and bleed, for a long time, and sometimes the Blood is with very great difficulty stopp'd, after they have done sucking, especially in Children, that are froward, or on parts where bandage cannot be made. A remarkable Story of this kind, we find in Dr. *Turner's* ingenious *Treatise, de morbis Cutaneis*. p. 380. &c. viz. " Thus (says he) when I
" first began to practice, being sent for five
" Miles out of Town, to attend a Gentleman's
" Child, in Summer time, I got there, by four a
" Clock, and set on a Couple of Leeches, which
" after

“ after they had done their business, fell, and
 “ the places were suffer’d to bleed, some little
 “ time after, the Blood running down a pace by
 “ drops, I apply’d some *farin. tritic.* with a Com-
 “ press dipp’d in Oxicate, and gave the Nurse a
 “ charge to keep her Fingers close, upon the
 “ parts as they grew warm, still dipping them in
 “ cold Water. It was low under the Ear; they
 “ happen’d to fix, and the more difficult to bind
 “ any thing on; leaving this charge, I took my
 “ Horse and rid two Miles farther, then retur-
 “ ning to the House, in about an Hour, I found
 “ the good Woman taking on, that the Child
 “ would bleed to death, and surely either the
 “ Leeches were not good, or they were not set
 “ right. The Infant seem’d truly by the Clothes,
 “ to have lost a pretty deal of Blood, and was
 “ turning Pale, which made me hope I should
 “ have less trouble, to repress the Flux, the same
 “ usually ceasing upon any *Syncope*. I found the
 “ good Woman had been at work with Cobwebbs,
 “ Bole Armeny, Tinder, and such like, I sent
 “ straitway to the Apothecary, for a bit of Crude
 “ Vitriol, or Allom, and dissolving some of the
 “ same, in a Spoonful of Water, I dipt a Com-
 “ press of Lint therein, and strowed over it,
 “ some fine Powder, of the same Vitriol, which
 “ I kept close with my Finger, for a quarter of an
 “ Hour: When during this Compression, the
 “ Child bled not a drop, but recovering its Fain-
 “ ting, and growing restless, as being held in the
 “ same Posture, it fell into a Fit of crying, and
 “ holding the Breath, streining the Muscles of
 “ the Neck, by which, altho’ I kept my Finger
 “ close, it ran down again, as at first; I then
 “ made up a fresh Compress, and stopp’d it again,
 “ shifting my Fingers by turns, to ease my self,
 “ and

“ and thus I continued for near an Hour, hoping
 “ by this time, we had a little Eschar, or
 “ Slough, made by the Vitriol. Upon taking off,
 “ my Finger, it seemed stopped, to my great sa-
 “ tisfaction, I then *left* more Pledgets for the
 “ Nurse, and sent to the Apothecary in the
 “ Town, to give him instruction if any fresh erup-
 “ tion should happen; when going to take Horse
 “ at the Door, the Nurse looking towards the
 “ place, found all in fresh Blood, having made
 “ its way thro’ the dressings, I then gave my
 “ Horse to the Servant to put up again, into the
 “ Stable, and return’d into the House, taking
 “ off the bloody Clothes, I clapt close down
 “ another Compress, to secure it, whilst I orde-
 “ red the Apothecary to bring me a little Viol
 “ of his *Ol. Vitrioli*. which being come, I shook it
 “ up against the Cork, and clapt the Bottom of
 “ the said Cork upon *one* Orrifice, which it was
 “ only big enough to cover, and then upon the
 “ *other*, which seemed in a manner secure. Upon
 “ the touch with the Cork, the Child thro’ the
 “ smart cried much, however the Orrifice there-
 “ by seemed shrivell’d up, and the bleeding next
 “ to nothing, I then applyed a fresh Pledget up-
 “ on the Orrifice, which had bled last, the other
 “ being perfectly stopp’d, and saw the Childs
 “ Head bound up again, yet notwithstanding, be-
 “ fore the Nurse had made an end, altho’ there
 “ was a Linnen Bolster made of several folds of
 “ Cloath, and the innermost sprinkled over with
 “ *Farina*, the Blood was got thro’, it being now
 “ late and time for me to think of going Home,
 “ whilst I was musing what I had best to do, I
 “ espied a Tobacco Pipe, in the Chimney Corner,
 “ and putting the same into the Fire not letting
 “ the Nurse know my intention, I ordered her
 “ to

“ to take all off again, the poor Woman affright-
 “ ed, took no notice, but when the dressings
 “ were off, and the Pipe as I thought hot, I fetch-
 “ ed it, from the Fire, making them believe I
 “ would let the Blood drop upon it, and that way
 “ stop the bleeding, when taking my opportuni-
 “ ty, whilst the Nurses Head was turned ano-
 “ ther way, and the Pipe heated a second time,
 “ being brought me, I suddenly clapt the end of
 “ it red hot as it was upon the bleeding Hole,
 “ which I just touched, and threw away the Pipe,
 “ the Child not crying, so much as at the Vitriol;
 “ after this, finding all secure, I apply’d nothing
 “ but a little dry Lint, and a bit of defensative
 “ Plaister, leaving behind me, some of my *Cerat.*
 “ *de lap. Calam.* to cure it as a Burn, ordering her
 “ only, to take care she forced not off the dres-
 “ sing, till it grew loose of it self, getting then on
 “ Horse back, I made the best of my way Home;
 “ and in few Days after, heard my little Patient
 “ had bled no more, the Crust casting off, and
 “ healing with two or three dressings, &c.

Of the Tooth-ach.

Its Cause.

THere are two Twiggs of the External *Caro-
 tid Artery*, which run under the Ear, and
 enter into the inferior *Maxilla*, disseminating thro’
 all its length, into the Root of every Tooth, for
 their Nourishment, in these *Vessels*, acrid Humours

pass with the Blood to the Teeth, and *vellicate* the Membrane that covers their interior *Medulla*, and this is the cause of the shooting, twinging pain, that is so commonly felt, and which is so little pittied, tho' perhaps it merits our commiseration, as much as many other Malladiès, with more pompous Names, and from this *Origin* of the Arteries, running to the Teeth, we are able to account, how Remedies applied behind the Ears, are more efficacious in giving ease, in the Tooth-ach, than if applied on the Temples.

Of Sarfa and China.

FOr my own part (says Dr. Fuffer) if I may have leave to speak out my own Experience, and private Sense, I have often seen where Sarfa and China, have *obtunded* the vigour of the Stomach, but never in all my Practice, could I once observe much good from them, to any one.

Of Calx or Lime.

IT affords an excellent Salt, whereby the Muriatick Particles of the Blood are precipitated, and the whole Mass becomes mild, and the more easily embraces the new Chile, and changeth it, into its own Nature, and hinders its Flux, to any Ulcer'd part, &c.

Of the Juices of Herbs.

They are the *first*, in the Family of *Antiscorbuticks*, and are conveyed into the Blood, in their *natural* State, without being spoiled by *coction*, or any other Artifice, they dilute, purifie, and soften Salt, torrid Blood, and correct a dry Habit, supplying it with mollifying moisture.

N. B. They are to be taken in the *Spring*, rather than at any other time, because they are then much more efficacious being enriched with volatile Salt, as may be seen by this, that if we prepare an essence of any Green Herbs, in April, or the beginning of May, it will look Red, like *Chio*, or Malvatick Wine, *which* it will *not do*, at any other Season.

Succus Scorbuiticus.

R \acute{e} Juice of both *sorts* of Scurvy Grass, Brooklime, and Water Cresses, *aa* ℥i Juice of Oranges ℥xx , White Sugar, ℔xii , dissolve the Sugar, and they will Clarifie with standing, and then strain for use; dose two or four Ounces Morning and Night.

Another.

R \acute{e} Juice of Plantane, Brooklime, Water Cresses and Dandelion, *aa* ℥i . let all stand to subside, and decant the clear, to which add *Aq. Raphan. Comp. & Lumbricor. Magistral.* *aa* ℥4 . *Spt. Cochlear.*

C c 4

℥i .

℥i. dose ℥℥, Morning and Night, for two or three Weeks.

Succus Cochlearia Vinofus.

℞ a large quantity of Garden Scurvy Grass, gathered in dry Weather, and Juiced will ferment with Yest, like Ale, in a Vessel; when it has done working, bung it up, and keep it in a cool Cellar, dose three or ʒ4. two or three times a Day.

Succus Hemorrhoides.

℞ Juice of Yarrow, depurated, ℔i. Sugar, ʒii. Misce, dose three or ʒ4. twice a Day.

Succus ad Hydropem.

℞ Plantane Leaves M4, Liverwort and Brooklime aa Mii. bruise them well in a Mortar, and add Aq. Raphani. Comp. ℥℥, and press out hard, dose ℥℥ in a Morning for two or three Weeks.

Succus Attemperans,

℞ Dandelyon, q. v. put it into a glazed Pipkin, with a Cover, which stop close with Paste, and set it in an Oven when Bread is drawn, and let it stand six Hours, and pour off the Liquor, without squeezing, it dilutes the Blood, corrects its acrid Salts, and is proper in all Cutaneous affections, dose ʒ4. twice a Day.

Of MISSLETOE.

THat it is a good Antepileptick, we do not deny, but *why* that of the *Oak* should be esteemed, above others, seems owing more to its scarcity, and the Superstition of the *Druids*, than to any Philosophical reason, *hitherto* assigned for it, that we have ever yet met with.

Of Balsam Capivi.

IT hath a Bitter Turpentine Taste, yet gives not a *Violet Smell* to Urine, but imparts to it, a manifest Bitter Taste, and very much takes off the muriatick Saltnefs, both from that and the *Saliva*, and *Serum*, and impresseth a Balsamick Character on the whole Mass of Blood. And tho' it be intensely bitter, yet it is agreeable to Hectick Persons, and *rather* abates than increaseth their heat. The reason is, supposed to be, from its Power to subdue Saltnefs, and Acrimony, and its destroying *putredinous iniquations*. Fuller.

Of

Of the Hair.

AN Hair is a small Body, Thread like, hard and flexible, *generally* four Square, sometimes Triangular, *seldom* round, but always *porous* length ways. They are generated from a certain thick, terrestrial, viscid Juice, bred out of the Blood, or some other Humour, and prepared after a *Specifick* manner out of this matter, or Juice, in the parts adapted for the generation and fixing of the Hair; and thus is the Hair generated, animated and shot forth, by the agitated heat, and afterwards nourished after the same manner.

The reason why the Hair of the Head first grows Grey.

It is because that in no part of the Body there is so much Flegm generated, as in the Head, which being infused into its Skin, cannot choose but settle more abundantly in the Alimentary Juice of the Hair, in Aged Poople than in the Young, who concoct less, and dissipate more the Crude Humour, from which Flegm, more closely mixed, the *White Colour* is given to the matter, and by that, to the Hair.

But in the other parts, as in the Privities, Arm-pits, &c. which are hotter, the Flegm happens to fix later, and so the Hairs become later Grey. *Diemerbroeck.*

The reason why a Person is Bald, on the fore Part of the Head, and not on the hinder Part, is because in the Cutis, and Cranium, of the *Sinciput*, there are no Muscles, or Fat, as there are on the

Occi-

Occiput, and so the *Cutis* there, becoming dry, and as it were *testaceous*, the Hair for want of moisture falls off, or the Person becomes *Bald*.

Of Gascoigns Powder.

THIS is a Medicine mightily in vogue, not only amongst the *most Learned* old Women, but eminent Physicians also, but for what reason, is very difficult to determine, for eleven parts in twelve are only the *Testacea*, and the twelfth part only Oriental Bezoar, and the dose commonly from gr. ten to Thirty, so that in a dose of 33 there is but gr. two and half of the Bezoar, so that the use of it, can be nothing but mere Custom and Fancy, for a Man may as well take a dose ten times as large, and do him no manner of harm, unless it puts his Pocket in a Sweat, because of its dearness. Now as nothing has any manner of potency, in the whole Composition, except the Bezoar, it is a very great question whether even *that* has any at all or not, for Dr. *Slare* indeavours to prove all Bezoars *fæctitious*, and if they are Animal Substances, I see not how that will much mend the matter, for they have neither Smell nor Taste, and give no sensible sensation to the Stomach, which is a shrewd Ground to suspect, that they are good for nothing, more especially if we consider that the Colour which Bezoar gives to *Gascoign's Powder*, is very easily Counterfeited, by levigating the *Testacea*, that it is compounded of, with the express'd Liquor, of which Syrup of Violets is made, which changes them of a Bezoar Colour,

very

412 *Of the Excrements, or Dung of Animals,*
very like the true Bezoar, which cannot be discover'd when mixed with the other Ingredients, but the Stone may be discover'd to be good or not, by rubbing its Colour upon White Paper *Chalk'd*, which Counterfeit Stones will not come up to, but whatever turns Green, with an Alkali, will help to Counterfeit the Bezoar, because such a Green, with an exact proportion of Yellow, may be easily brought to a true Bezoar Colour.

Of the Excrements, or Dung of Animals.

THat of Fowls consists of two distinct parts, *the at one* dark Colour'd and Chaffey, this is the undigested reliëts of the Food, and good for nothing: *The other* White, and uniform, which being the recrement of the Blood, thrown off in the last Digestion, and enriched with volatile *Salts*, is the *only part* that has Vertue in it.

Of Pidgeons Dung.

It consists of hot subtile parts, which open the Pores, where it is applyed, and by rarifying and expanding them, occasions a greater Fux of Fluid *that way*, and this is the reason why they are order'd sometimes in Cataplasmes, to be laid to the Soles of the Feet in *Deliriums*, and malignant Feavers.

Of Cows Dung.

It is said to be of a hot penetrating Nature; helps *Erisipelatous* Swellings, by discussing the beginning Obstructions, in the Capillaries, and breathes them away by transpiration, it is also commended in the Gout, but altho' I am extremely afflicted with it, yet so long as there is any other proper Application, to be met with, in the whole republick of Medicine, I think I shall hardly be so *naustily* inclin'd, as to apply this filthy thing, to my pained Limbs.

Of Album Græcum, or Dogs Dung.

This is reckoned to be of an absterfive Nature, and used by the common People to cure what they call *fore Throats*, but till I know nothing else good for that purpose, I shall never advise any body to use it, and have said something to it in another place to which I refer.

Of Goose Dung.

It is counted hot, nitrous, and penetrating, reckon'd good in the Jaundice, which indeed it may be, if only the White part is used, which abounds with *Animal Salt*, but it is very much now, out of practice.

Of Peacocks Dung.

This has been in great Fame amongst *Epilepticks*, but as I have not yet met with any Philosophy,
able

able to give me a reason for its use, in that Dis-temper, I shall say nothing at all about it.

Of Stone Horse Dung.

It is highly cryed up in Pleurifies, Inflammations, and Obstructions of the Breasts, and sometimes in Asthma's, it is much in use; it is best given in decoction, and Clarified, being first gently simmer'd, and close stopp'd; it is commonly done in *Aq. Hissopi. vel. Pulegij*, and White Wine is reckon'd the best thing to take off its nauseousness, but when you have done all you can, it will both smell, and taste, like a Horse T—d, *as it is.*

Of the Humidum Radicale.

When the Blood in circulation arrives at the extremities; of the Arteries, the fine subtile Oil is thrown off, and conveyed by certain small Channels into the Cavities, of the Bones; but it is not *wholly* lodged there, some portion of it, being received, into the Veins, it circulates with the Blood, and this Balsamick substance, is of great use to sheath the *vicious* Salts, and reduce the Blood to a laudable temper, makes it more fluid, and hotter disposed for circulation, and insinuating it self, into the Pores of the Bones, makes them more subtile, &c.

Of the Vital Flame.

THE Vital Flame, or actual heat *within us*, is maintain'd and continued by the constant addition of *Nitro-aerious* Particles, which we daily *inspire*, and which are the Authors, Engineers, and peculiar intendants, of the functions ascribed to the *Animal Oeconomy*: *This is that* which buoys up, and supports this curious Fabrick, and sustains and preserves its being; *this is the Fountain and Original of Life, yea even Life it self.*

Of the Gout, a Caution.

GOUT Medicines ought to be Compos'd, 1. Of Stomachicks, to corroborate the Ventricle, and Intestines, to prevent the morbidick matter from falling on them; And 2. Of Digestives, to keep the Blood, in a due mixture, and hinder its *fusion*. 3. Of such as comfort the Nerves, to hinder the raging *Excadesence* of the Spirits. And, 4. Of Diureticks to drain off, the Arthritick Humours, by Urine, and so secure it, from rushing on the Joints.

Of

Of the Rickets.

Sidenham says, that the Rickets are seldom rise; but in those Years when Autumnal Agues reign; they were scarce heard of till the Year 1630, and were not mentioned in the Bills of Mortality till 1634, and then, but fourteen for that whole Year, from which time, they increased so, as to be five Hundred and twenty one, in the Year 1660, and now they are decreased again, and may perhaps in some Years, quite disappear again, like a Comet.

Of Gold.

Whether it has any Medicinal Vertues?

That Gold in substance, or reduced into the smallest Particles, by the Hammer, (as in the Leaf Gold) is *not digestable*, in the Stomach, so as to mix with the Blood, and to be *there*, of any efficacy, is certainly a great truth: Gold being a *dead Body*, and operates nothing at all, of *it self*, but say some when its Body is opened, by the power of Mercury, its Sulphur loosen'd from its Chains, and its substance (which is all Tincture) made in a manner volatile, it must have a very great *potency*, not only in the Pox, but in the *Scrophula*, and many other stubborn Diseases.

Mercury

Mercury, say they, is a most volatile, unfix'd Substance; but this, by *Amalgamation*, and Union with the Gold, becomes more fix'd, and *then* they act, as it were, in concert together; for its Body, being turned inside out, and its Sulphur intimately mixed, with the Sulphur of the Gold, and in some measure fixed by that, as that solar Sulphur, is in a great Measure volatilized, by this Conjunction they far out do, by many Degrees, whatever they could be supposed to do, *singly*; and with ten times the safety, that any Preparation of Mercury, would do alone.

And although some Wise Men Laugh, at all Preparations of it, as if they had no Virtue at all in them, yet the contrary Opinion has many Friends of good Credit, as *Zacutus*, *Lusitanus*, *Avicen*, *Serapion*, *Geber*, *Quercetan*, *Schroder*, *Zwelfer*, &c.

But of late, Dr. *Quincy* has said so much to the purpose, (in a few Words) to expose the Knavery of those, who pretend to do great Feats, from its Preparations; that I am under no great Temptation, to defend its use; but leave it to those who have more Gold, and Faith in its Efficacy also, than I am at present Master of, to make tryal of its Vertues; for I shall neither affirm, nor deny, any thing about it. Having never had any Experience of its use and excellency in Physick, any farther, than it handsomely covers a Pill or a Bolus, or is pleasing to the Eye in a Cordial, &c. Yet altho' I have had no Experience of its *Medicinal use*, thus far, I think, I can safely affirm, that if you can make a Meal of it, *it will do you no harm*, and if you take *none*, I dare say that you will be as well, as if you had swallow'd a Peck of it for a Breakfast, and if it is a Cordial any way, it is *so*, in the Pocket.

Of Precious Stones.

Whether they have any Medicinal Vertues ?

THese have got a place in Medicine, much after the same manner, that Gold has, as being very dear, and so to countenance the exorbitant Price of a Composition, for the Benefit of the *Vender*, rather than from any intrinsic Vertue they possess. For, in the first place, they are not fit for taking inwardly, without a very tedious levigation; and if they are not levigated very fine, the Asperities of their Angles, will (like Glass of the same size) be very injurious to the Coates of the Stomach, and if they were of any use, it could be only in the *Prime Via*, and could not pass the *Lacteals*, and even in levigating, they will wear off so much from the *Porphiry* as near to double their Quantity, and by Consequence, half the Medicine is pure *Marble*, instead of Pretious Stone: But, if it was not so, what is there in such a precious Stone, (such a hard Body,) for the animal Digestion to draw out? The short of the Story is, that I believe it is all an Imposition, and what we call a *Cheat*; and therefore I give you this Warning to avoid it.

Of

Of the Royal Touch.

That of a Dead Man's Hand, and of a Seventh Son, &c.

THE first of these seems to be a Political Trick, used by Tyrannical Governors to awe their Subjects; and they might with as good Reason attempt to cure the Cramp, or Kibed Heels; for if there was any thing of real Vertue in it, *all* would be cured, (if ordained for Life) as well as *some*; which plentiful Experience tells us, they are not, but *according* as the solemn Appearance and Solemnity of the Matter, strikes the Imagination in the Patient; such is, *generally* the Success of the Cure, in this sort of *Exorcism*; and that is the Reason that *fewer* Children, have been cured, by the *Royal Touch*, than Adult Persons, their Imaginations being not so capable of being struck with this sort of Royal *Hocus Pocus*, as the others; but why the Original Royal Saint, who it is pretended had this Gift bestow'd on him; shou'd have it for the Cure of a *Scrophula*, rather than Gout, Stone, or Leprosy, (much more afflictive Distempers) *or rather*, why not for the Cure of *all* of them, rather than this *one*, is a Riddle, that none but a Priest, or Popish Bigot can unfold: For my own Part, I have no more Faith in it, than I have in

The Touch of a Dead Man's Hand.

A Thing in great Esteem, amongst some superstitious People, and for the Cure of *Scrophula's* too.

And Oh Dear ! the many strange Cures that they tell you have been performed hereby ! and very possibly some of them may be true. 1. As the Imagination in the Patient (as in the Royal Touch) contributes a great deal towards such Efficacy. And, 2. Because stroaking *in such a manner*, gives a strange *Surprize* and *Chillness*, upon the Part touched, which Sensation may cause the Fibres to contract, and so to loosen, shake off and dislodge, the obstructed Matter, in which consists the Cure ; but for any thing else, there is no more in the Touch from the Hand of a *Dead Subject*, than from that of a *living Sovereign* ; nor from either of them ; than from that of a *Seventh Son*, which is as great a *Bite*, as either of the former, and have all an equal Vertue : That is, *none at all*, any farther than Imagination brings it about : And, *so far*, you might have a Cure *as well*, by rubbing the Part with a Broomstick.

It not being so much my Business in this Treatise, to teach *what* to prescribe, as *why* Medicines of any Nature are prescribed ; and the *Reason* of their Operation on the Fluids ; I have given very few Forms of Compositions quite through this Book ; For, indeed, most Authors are so full of *Recipe's*, that it would be almost endless to follow them : But Dr. Quincy having very judiciously collected what is most valuable, out of those of the best note, and placed them in his *Pharmacopeia* ; the Reader will find abundant satisfaction *there* ; However, for his greater Ease, I have taken the Pains by References, to particular Pages of that Book, to shew him *where* under proper Heads, he may directly find rational Forms, for every Occasion ; But they are taken from the first Edition of that Book, Printed, *Anno 1718. viz.*

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Juleps, Draughts and Mixtures	530	Electuaries 546
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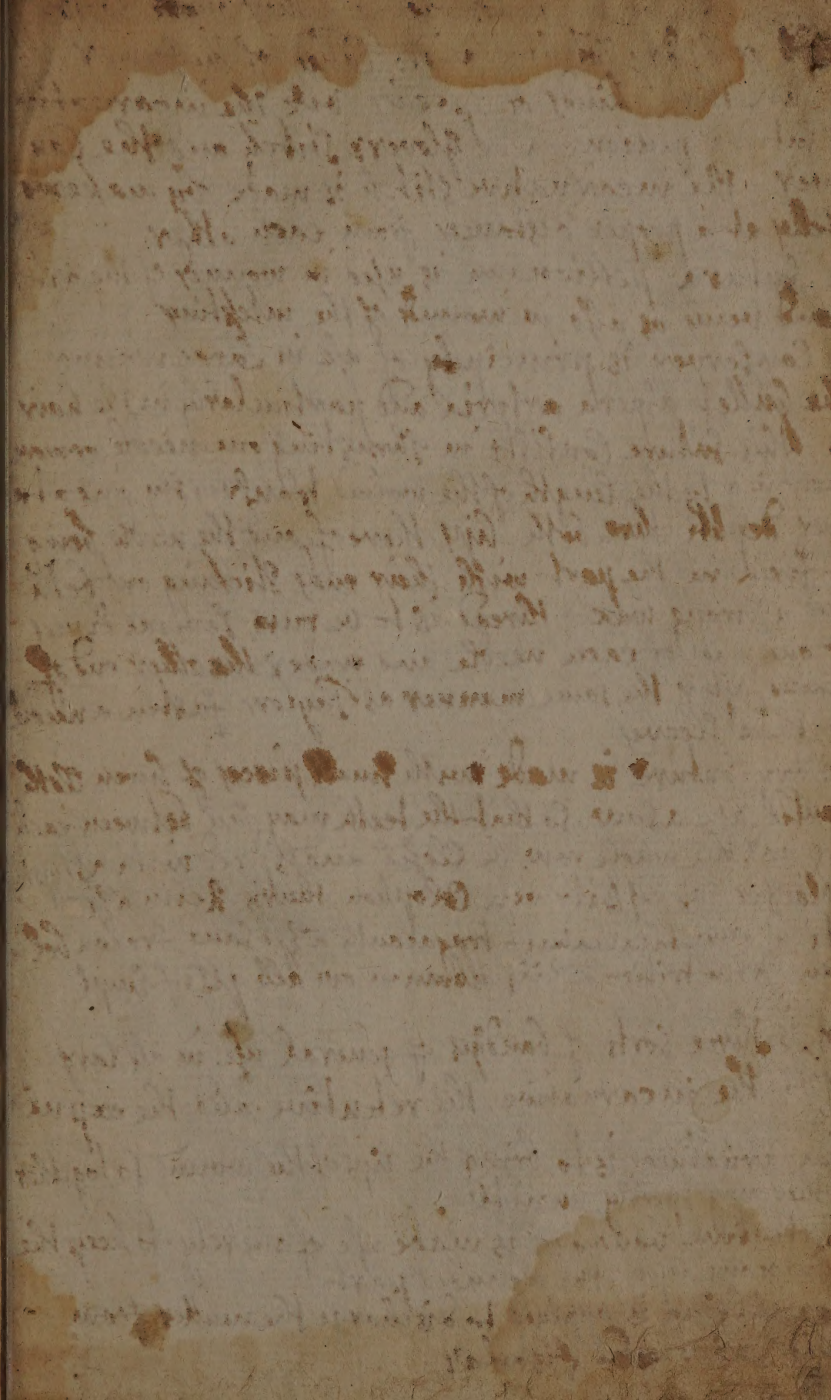
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F I N I S.



Sutures are of two kinds being either made with
needle or by dry stitching as its called of the former
there are three kinds or species viz the incarnative
the Sutura pellionum or Glover's Stitch and the Con-
server the incarnative stitch is made by making
stitches at a proper distance from each other
the Sutura pellionum is used in wounds of the arte-
ries and veins as also in wounds of the intestines
the Conservor is principally of use in large wounds
the Gullet alpera arterial and particularly in the hair
lip this Suture consists in thrusting one needle or more
according to the length of the wound transversely and at
proper depth thro both lips thereof and the needles being
left fixed in the part with their ends sticking out both
ways a strong waxed thread is to be run several times
over one end of each needle and under the other end of
the same after the same manner as Paylor fasten a needle
upon a sleeve

The dry Suture is made with small pieces of linen cloth
indentured like a saw so that the teeth may fall between each
other and the whole row be closed and lined with a styptic
plaster as 4 Bitumen Colophon Gummi Resin a 3i
Castor oil gum lacamahar tragacanth a 3i Sang Dragon Bo-
rmen Gum Arabic a 3iij albumen ovi alb q.s of Euph

There is three sorts of bandages of general use in all large
wounds the incarnative the retentive and the expul-
sive

The incarnative is to bring the lips of the wound so together
that they may speedily unite

The Retentive bandage is made use of merely to keep the
dressings one upon the wounded part

The expulsive is applied to discharge the matter from
wounds ^{sinous} ulcers and fistulae

unite
Suburbs or sticking are of two kinds

C

